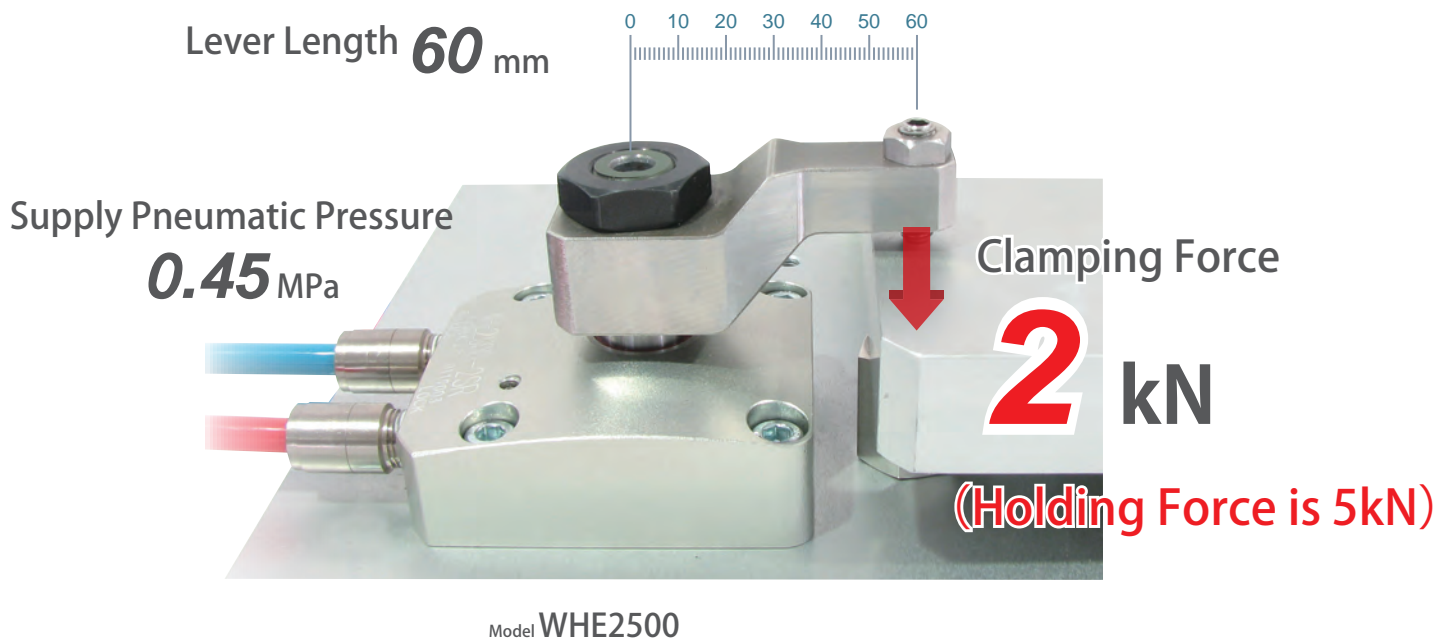


# High-Power Pneumatic Swing Clamp

Model WHE



Clamping force which replaces hydraulic clamp  
Development of high power pneumatic swing clamp PAT.P.



Clamping Force  
(Compared with conventional WHA model)

**About 3 Times**

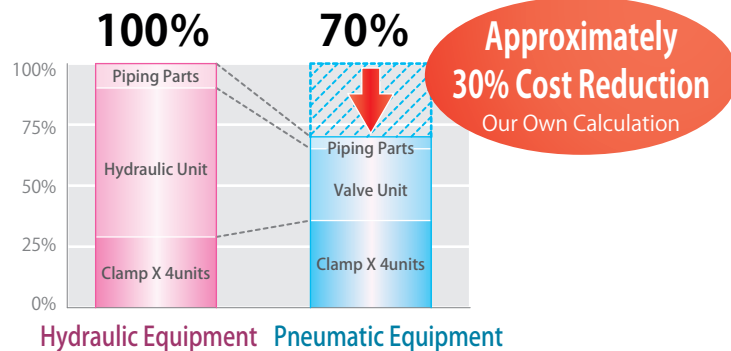
Available in five body sizes.

Cylinder force is **0.23 ~ 3.86kN**

## ● Elimination of Hydraulics

The hydraulic power pack and clamping systems can be eliminated by using pneumatic systems.

### Implementation Cost Comparison

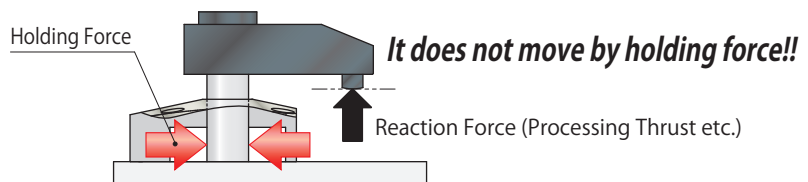


## ● Holding Force

Clamping force is suppressed to necessary minimum by the powerful holding force beyond clamping force, and work distortion can be decreased.

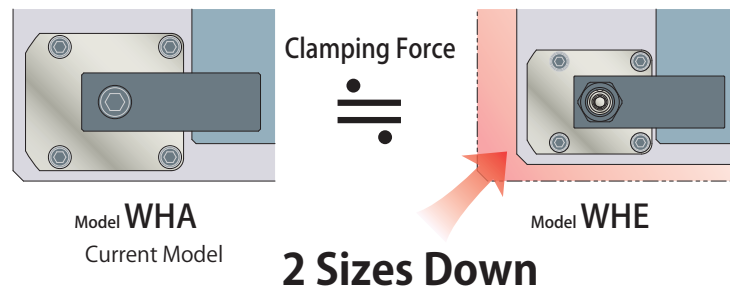
※1. It change with the working pressure and lever length.

Holding force is 3 times the clamping force by a mechanical lock. ※1



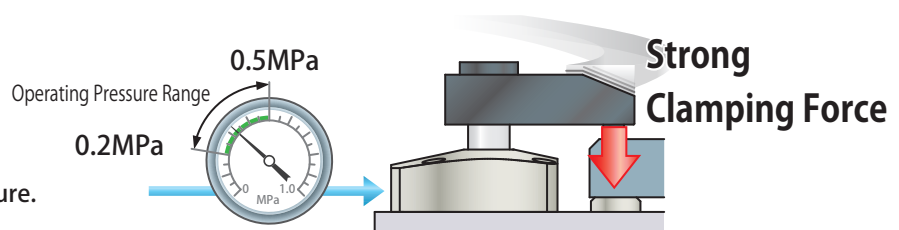
## ● Space-Saving

Equivalent clamping force by 2 size down than current WCA.



## ● Energy Saving

Higher clamping force is achieved by low operating pressure.



**High-Power Series**

- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

**High-Power Pneumatic Swing Clamp**

**WHE**

High-Power Pneumatic Link Clamp

WCE

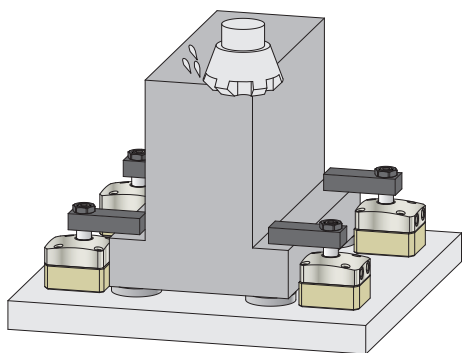
High-Power Pneumatic Work Support

WNC

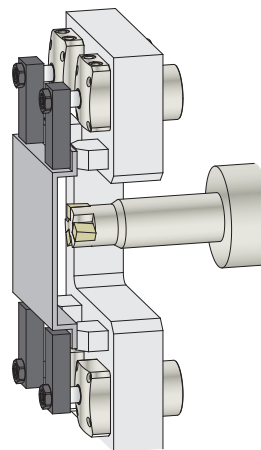
High-Power Pneumatic Pallet Clamp

WVS

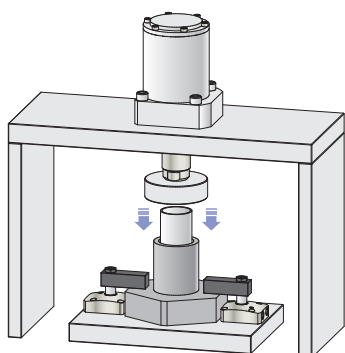
## Application Examples



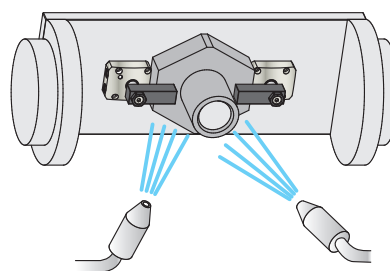
< Machining Process >



< In the Backside Machining >

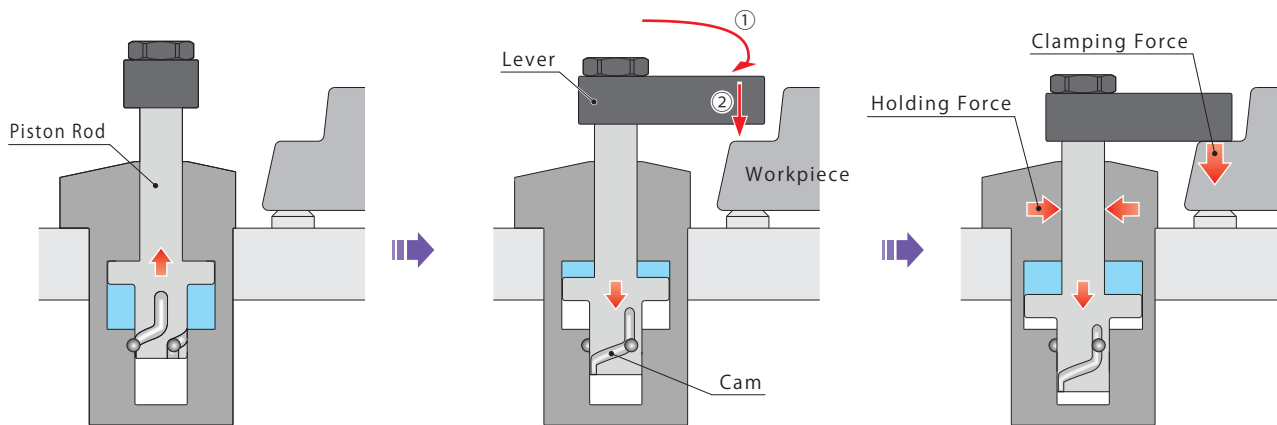


< In the Press Fit Process >



< For the Cleaning Process >

## Action Description ※This drawing is simplified diagram. The component of parts is different from it's real.



Release Air Pressure : ON  
Lock Air Pressure : OFF

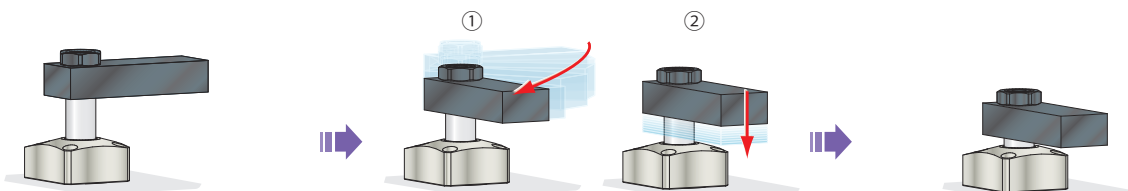
Piston rod rises.

Release Air Pressure : OFF  
Lock Air Pressure : ON  
(In the middle of pressure rising)

- ① Swing operates while a piston descends along the cam.
- ② Piston descends perpendicularly after the completion of swing until a lever clamps the work.  
(Please clamp a work within the range of lock stroke.)

Release Air Pressure : OFF  
Lock Air Pressure : ON  
(Pressure rising completion)

Work is clamped.  
The internal mechanical lock operates and clamping force and holding force achieved.



**High-Power Series**

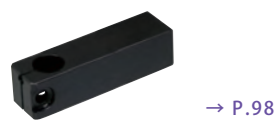
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

- High-Power Hydraulic Swing Clamp
  - LHE
- High-Power Hydraulic Link Clamp
  - LKE
- High-Power Pneumatic Hole Clamp
  - SWE
- High-Power Pneumatic Swing Clamp**
  - WHE**
- High-Power Pneumatic Link Clamp
  - WCE
- High-Power Pneumatic Work Support
  - WNC
- High-Power Pneumatic Pallet Clamp
  - WVS

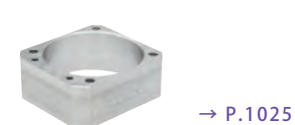
<b>Standard Model</b>			
	Model <b>WHE</b> External Dimensions → P.81	Clamp with 90° swing	
Action Description	Model <b>WHE-D</b> External Dimensions → P.83	Double End Rod Option for Dog Piston rod condition can be detected by switch etc	
	Model <b>WHE-M</b> External Dimensions → P.85	Air Sensing Manifold Option	
	Model <b>WHE-N</b> External Dimensions → P.87	Air Sensing Piping Option Clamping action is possible to confirm with air catch sensor	
Option	Model <b>WHE-F</b> External Dimensions → P.89	Quick-Change Lever Option Quick change lever type that is available as option is easy to attach and detach the lever with one wrench	
	Model <b>WHE-P</b> External Dimensions → P.91	Balance Lever Option One clamp can secure two workpieces	
	Model <b>WHE-Y</b> External Dimensions → P.93	Swing Angle Selectable Option Available with 30° 45° 60° Swing Angle	

**Accessories**

**Lever**  
Model **WHZ-T、WHZ-F/B**



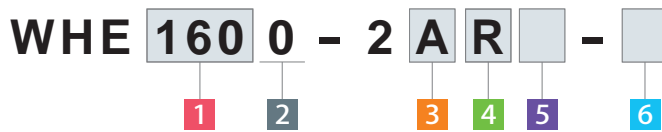
**Manifold Block**  
Model **WHZ-MD**



**Speed Control Valve**  
Model **BZW-B**



## Model No. Indication



### 1 Cylinder Force

- 060** : Cylinder Force 0.6kN (Pneumatic Pressure 0.5MPa)
- 100** : Cylinder Force 1.0kN (Pneumatic Pressure 0.5MPa)
- 160** : Cylinder Force 1.6kN (Pneumatic Pressure 0.5MPa)
- 250** : Cylinder Force 2.4kN (Pneumatic Pressure 0.5MPa)
- 400** : Cylinder Force 3.9kN (Pneumatic Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

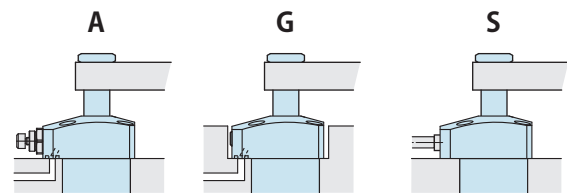
### 2 Design No.

**0** : Revision Number

### 3 Piping Method

- A** : Gasket Option (with Ports for Speed Controller)
- G** : Gasket Option (with R Thread Plug)
- S** : Piping Option (Rc Thread)

※ Speed control valve (BZW) is sold separately  
Refer to the P.213 for detail



Gasket Option

Piping Option

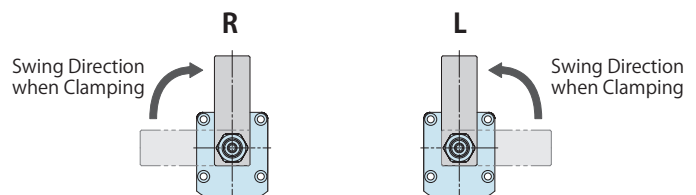
With Ports for Speed Controller  
Includes R Thread Plug  
(order speed controller separately)

with R Thread Plug

Rc Thread  
No Gasket Port

### 4 Swing Direction when Clamping

- R** : Clockwise
- L** : Counter-Clockwise



### 5 Action Confirmation Method

- Blank** : Standard
- D** : Double End Rod Option for Dog
- M** : Air Sensing Manifold Option
- N** : Air Sensing Piping Option

### 6 Option

- Blank** : Standard: Taper Lock Lever Option
- F** : Quick-Change Lever Option
- P** : Balance Lever Option
- Y□** : Swing Angle Selectable Option  
(**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)

※ Please contact us when action check method have a combination with option.

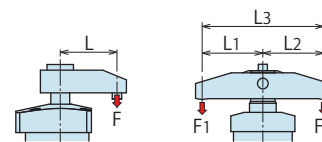
## Specifications

Model No.	WHE0600-2□□-□			WHE1000-2□□-□			WHE1600-2□□-□			WHE2500-2□□-□					
Cylinder Force (Pneumatic Pressure 0.5MPa) kN	0.6			1.0			1.6			2.4					
Clamping Force (Calculation Formula) <sup>※1</sup> kN	6 When Blank /F/Y□ is chosen	$F=(1.1666-0.00287\times L)\times P$			$F=(1.8842-0.00346\times L)\times P$			$F=(3.0603-0.00505\times L)\times P$			$F=(4.7875-0.00654\times L)\times P$				
	6 When P is chosen	$F_1=(L_2/L_3)\times 1.129\times P$ $F_2=(L_1/L_3)\times 1.129\times P$			$F_1=(L_2/L_3)\times 1.951\times P$ $F_2=(L_1/L_3)\times 1.951\times P$			$F_1=(L_2/L_3)\times 3.134\times P$ $F_2=(L_1/L_3)\times 3.134\times P$			$F_1=(L_2/L_3)\times 4.888\times P$ $F_2=(L_1/L_3)\times 4.888\times P$				
Holding Force (Calculation Formula) <sup>※1</sup> kN	6 When Blank /F/Y□ is chosen	$F_k=\frac{2.771\times P}{1-0.0025\times L}$			$F_k=\frac{4.08\times P}{1-0.0021\times L}$			$F_k=\frac{6.628\times P}{1-0.0012\times L}$			$F_k=\frac{10.481\times P}{1-0.0008\times L}$				
	6 When P is chosen	$F_{k1}=(L_2/L_3)\times 2.771\times P$ $F_{k2}=(L_1/L_3)\times 2.771\times P$			$F_{k1}=(L_2/L_3)\times 4.08\times P$ $F_{k2}=(L_1/L_3)\times 4.08\times P$			$F_{k1}=(L_2/L_3)\times 6.628\times P$ $F_{k2}=(L_1/L_3)\times 6.628\times P$			$F_{k1}=(L_2/L_3)\times 10.481\times P$ $F_{k2}=(L_1/L_3)\times 10.481\times P$				
6 When F/P is chosen	Full Stroke	mm	14			14.5			15			17.5			
	Swing Stroke (90°)	mm	8			8.5			9			11.5			
	Vertical Stroke	mm	6												
	(Break down)	Idle Stroke	mm	2											
	(Break down)	Lock Stroke <sup>※2</sup>	mm	4											
	Swing Angle Accuracy		90° ±3°												
6 When Y□ is chosen	Swing Completion Position Repeatability		±0.75°												
	Option Code		Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	
	Full Stroke	mm	9.6	10.7	11.8	10.5	11.5	12.5	11.1	12	13	13	14.1	15.3	
	Swing Stroke	mm	3.6	4.7	5.8	4.5	5.5	6.5	5.1	6	7	7	8.1	9.3	
	Vertical Stroke	mm	6												
	(Break down)	Idle Stroke	mm	2											
	(Break down)	Lock Stroke <sup>※2</sup>	mm	4											
	Swing Angle Accuracy		30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	
Swing Completion Position Repeatability		±0.75°													
Max. Operating Pressure	MPa	0.5													
Min. Operating Pressure <sup>※3</sup>	MPa	0.2													
Withstanding Pressure	MPa	0.75													
Operating Temperature	°C	0 ~ 70													
Usable Fluid		Dry Air													

Model No.	WHE4000-2□□-□					
Cylinder Force (Pneumatic Pressure 0.5MPa) kN	3.9					
Clamping Force (Calculation Formula) <sup>※1</sup> kN	6 When Blank /F/Y□ is chosen	$F=(7.6871-0.00947\times L)\times P$				
	6 When P is chosen	$F_1=(L_2/L_3)\times 7.713\times P$ $F_2=(L_1/L_3)\times 7.713\times P$				
Holding Force (Calculation Formula) <sup>※1</sup> kN	6 When Blank /F/Y□ is chosen	$F_k=\frac{16.806\times P}{1-0.0006\times L}$				
	6 When P is chosen	$F_{k1}=(L_2/L_3)\times 16.806\times P$ $F_{k2}=(L_1/L_3)\times 16.806\times P$				
6 When F/P is chosen	Full Stroke	mm	19.5			
	Swing Stroke (90°)	mm	13.5			
	Vertical Stroke	mm	6			
	(Break down)	Idle Stroke	mm	2		
	(Break down)	Lock stroke <sup>※2</sup>	mm	4		
	Swing Angle Accuracy		90° ±3°			
6 When Y□ is chosen	Swing Completion Position Repeatability		±0.75°			
	Option Code		Y30	Y45	Y60	
	Full Stroke	mm	14	15.3	16.7	
	Swing Stroke	mm	8	9.3	10.7	
	Vertical Stroke	mm	6			
	(Break down)	Idle Stroke	mm	2		
	(Break down)	Lock stroke <sup>※2</sup>	mm	4		
	Swing Angle Accuracy		30° ±3°	45° ±3°	60° ±3°	
Swing Completion Position Repeatability		±0.75°				
Max. Operating Pressure	MPa	0.5				
Min. Operating Pressure <sup>※3</sup>	MPa	0.2				
Withstanding Pressure	MPa	0.75				
Operating Temperature	°C	0 ~ 70				
Usable Fluid		Dry Air				

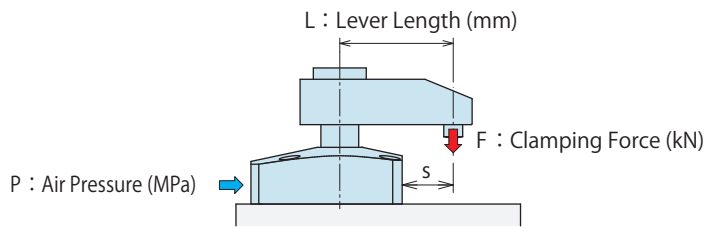
### Notes

- ※1. F, F1, F2 : Clamping force (kN) 、Fk, Fk1, Fk2 :Holding force (kN) 、P : Supply air pressure (MPa) 、L, L1, L2 : distance between the piston center and the clamping point (mm) 、L3 : (mm).
  - ※2. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.99
  - ※3. Minimum pressure to operate the clamp without load. The swinging may stop in the middle of action due to the lever shape (Refer to P.99 for consideration for lever design.)
1. Please see the external dimension if you need the information of mass and cylinder volume.



## Clamping Force Curve

※ WHE□□0-2□□□-P : For balance lever option, the clamping force curve is different from the graph. Please calculate it with the specification's formula.



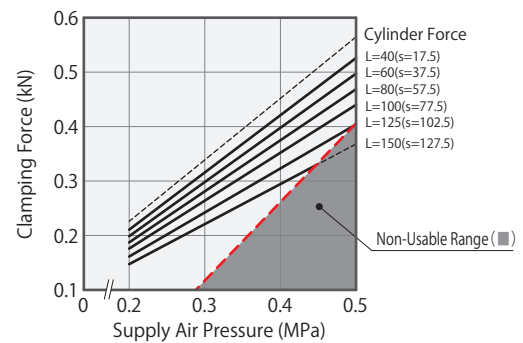
(How to read the clamping force curve)

When using WHE1600  
 Supply Air Pressure 0.4MPa  
 Lever Length L=60mm  
 Clamping force is about 1.1kN.

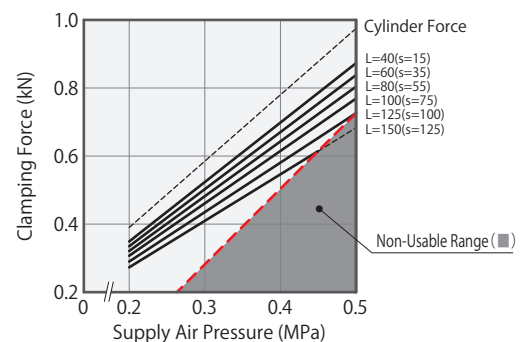
### Notes

- ※1. F : Clamping Force (kN) , P : Supply Air Pressure (MPa) , L : Lever Length (mm).
- 1. Tables and graphs shown are the relationship between the clamping force(kN) and supply air pressure (MPa).
- 2. Cylinder output(When L=0) cannot be calculated from the calculation formula of clamping force.
- 3. Clamping force shows the capability at the time of clamping within the range of clamp stroke.  
 (Please refer to "a specification value is not fulfilled when it clamps out of the clamp stroke range." on P.99)
- 4. The clamping force is shown with lever in the locked position.
- 5. The clamping force varies as per the lever length. Please use it with supply pneumatic pressure suitable for lever length.
- 6. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

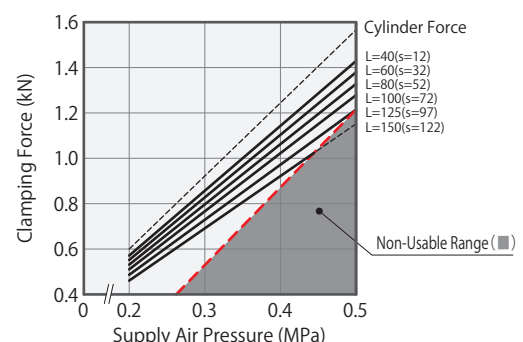
WHE0600		Clamping Force Calculation Formula <sup>※1</sup> (kN) $F=(1.1666 - 0.00287 \times L) \times P$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Max. Lever Length (mm)
		Lever Length L (mm)						
		40	60	80	100	125	150	
0.5	0.57	0.53	0.50	0.47	0.44	■	■	120
0.4	0.45	0.42	0.40	0.37	0.35	0.32	0.29	180
0.3	0.34	0.32	0.30	0.28	0.26	0.24	0.22	180
0.2	0.23	0.21	0.20	0.19	0.18	0.16	0.15	180
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.49	0.44	



WHE1000		Clamping Force Calculation Formula <sup>※1</sup> (kN) $F=(1.8842 - 0.00346 \times L) \times P$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Max. Lever Length (mm)
		Lever Length L (mm)						
		40	60	80	100	125	150	
0.5	0.98	0.87	0.84	0.80	0.77	0.73	■	125
0.4	0.78	0.70	0.67	0.64	0.62	0.58	0.55	180
0.3	0.59	0.52	0.50	0.48	0.46	0.44	0.41	190
0.2	0.39	0.35	0.34	0.32	0.31	0.29	0.27	190
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	



WHE1600		Clamping Force Calculation Formula <sup>※1</sup> (kN) $F=(3.0603 - 0.00505 \times L) \times P$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Max. Lever Length (mm)
		Lever Length L (mm)						
		40	60	80	100	125	150	
0.5	1.57	1.43	1.38	1.33	1.28	1.22	■	125
0.4	1.25	1.14	1.10	1.06	1.02	0.97	0.92	174
0.3	0.94	0.86	0.83	0.80	0.77	0.73	0.69	200
0.2	0.63	0.57	0.55	0.53	0.51	0.49	0.46	200
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	

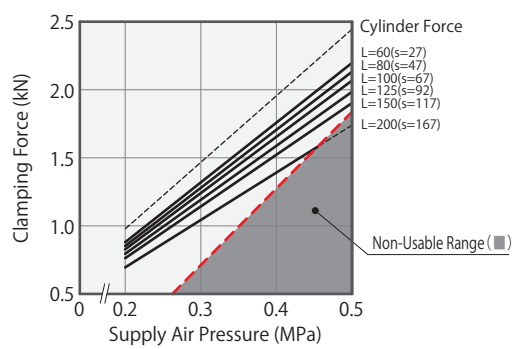


- High-Power Series**
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

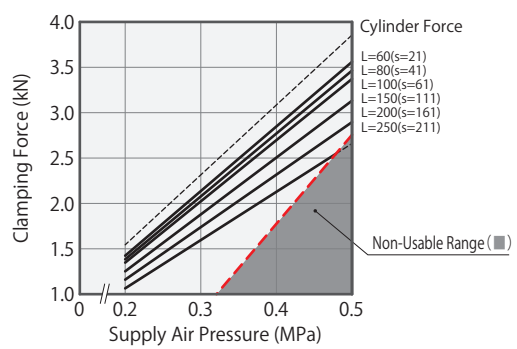
- High-Power Hydraulic Swing Clamp
  - LHE
- High-Power Hydraulic Link Clamp
  - LKE
- High-Power Pneumatic Hole Clamp
  - SWE

- High-Power Pneumatic Swing Clamp**
  - WHE**
- High-Power Pneumatic Link Clamp
  - WCE
- High-Power Pneumatic Work Support
  - WNC
- High-Power Pneumatic Pallet Clamp
  - WVS

<b>WHE2500</b>		Clamping Force Calculation Formula <sup>**1</sup> (kN) $F=(4.7875 - 0.00654 \times L) \times P$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Max. Lever Length (mm)
		Lever Length L (mm)						
		60	80	100	125	150	200	
0.5	2.44	2.20	2.13	2.07	1.99	1.90	■	170
0.4	1.96	1.76	1.71	1.65	1.59	1.52	1.39	245
0.3	1.47	1.32	1.28	1.24	1.19	1.14	1.04	270
0.2	0.98	0.88	0.85	0.83	0.79	0.76	0.70	270
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.45	



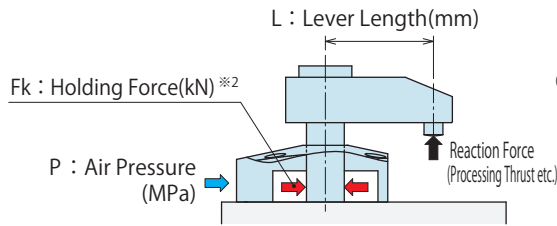
<b>WHE4000</b>		Clamping Force Calculation Formula <sup>**1</sup> (kN) $F=(7.6871 - 0.00947 \times L) \times P$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Max. Lever Length (mm)
		Lever Length L (mm)						
		60	80	100	150	200	250	
0.5	3.86	3.56	3.46	3.37	3.13	2.90	■	230
0.4	3.09	2.85	2.77	2.70	2.51	2.32	2.13	330
0.3	2.32	2.14	2.08	2.02	1.88	1.74	1.60	330
0.2	1.54	1.42	1.39	1.35	1.25	1.16	1.06	330
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.48	





## ● Holding Force Curve

※ WHE□□0-2□□□-P : For balance lever option, the holding force curve is different from the graph. Please calculate it with the specification's formula.

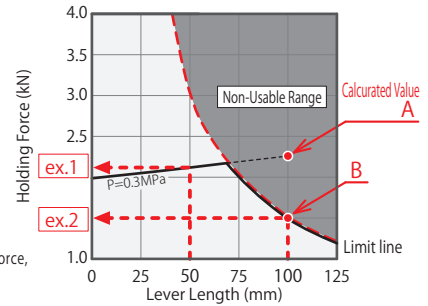


(How to read Holding Force Curve : example1)  
When WHE1600 is used.

Supply Air Pressure 0.3MPa、Lever Length L=50mm  
Holding force is about 2.1kN.

(How to read Holding Force Curve : example2)  
When WHE1600 is used.

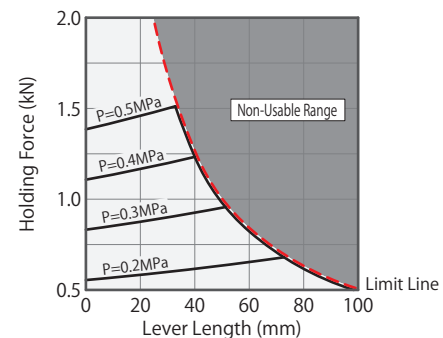
Supply Air Pressure 0.3MPa、Lever Length L=100mm  
The calculated value becomes the holding force of the point A, but it becomes a non-usable range.  
The value of intersection B which met the limit line becomes holding force which can counter to reaction force, and holding force becomes about 1.5kN.



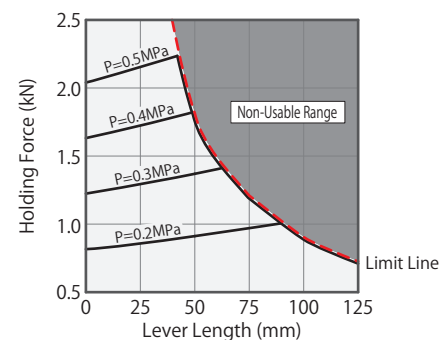
### Notes

- ※2. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamp force.  
Moreover, keep in mind that it may produce displacement depending on lever rigidity even if it is the reaction force below holding force.  
(When slight displacement is also not allowed, please keep the reaction force beyond clamp force from being added.)
  - ※3. Fk : Holding force (kN), P : Supply air pressure (MPa), L : Lever length (mm).  
When a holding force calculated value exceeds the value of a limit line, holding force becomes a value of a limit line.
1. This table and the graph show the relation between holding force (kN) and lever length (mm).
  2. Holding force shows the capability at the time of locking within the range of lock stroke.  
(P.99 When clamping out of the lock stroke range, it doesn't fulfill a specification value.)
  3. Holding force shows capability when a lever locks in a horizontal position.
  4. Holding force changes with lever length. Please use it with supply pneumatic pressure suitable for lever length.
  5. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

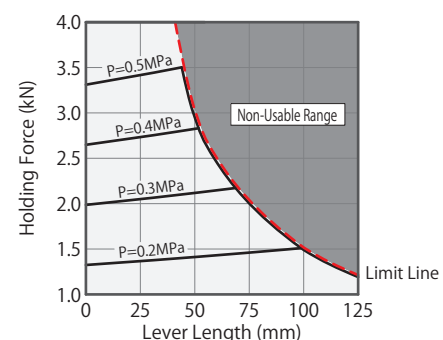
<b>WHE0600</b>	Holding Force Formula ※3 (kN) (Fk ≤ Limit Line Value)		$Fk = \frac{2.771 \times P}{1 - 0.0025 \times L}$				
	Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (■)					
		Lever Length L (mm)					
		40	60	80	100	125	150
	0.5	1.23	0.82	0.62	0.49		
	0.4	1.23	0.82	0.62	0.49	0.40	0.33
	0.3	0.93	0.82	0.62	0.49	0.40	0.33
	0.2	0.62	0.65	0.62	0.49	0.40	0.33



<b>WHE1000</b>	Holding Force Formula ※3 (kN) (Fk ≤ Limit Line Value)		$Fk = \frac{4.08 \times P}{1 - 0.0021 \times L}$				
	Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (■)					
		Lever Length L (mm)					
		40	60	80	100	125	150
	0.5	2.23	1.51	1.13	0.91	0.73	
	0.4	1.78	1.51	1.13	0.91	0.73	0.61
	0.3	1.34	1.40	1.13	0.91	0.73	0.61
	0.2	0.89	0.93	0.98	0.91	0.73	0.61



<b>WHE1600</b>	Holding Force Formula ※3 (kN) (Fk ≤ Limit Line Value)		$Fk = \frac{6.628 \times P}{1 - 0.0012 \times L}$				
	Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (■)					
		Lever Length L (mm)					
		40	60	80	100	125	150
	0.5	3.48	2.53	1.90	1.52	1.22	
	0.4	2.79	2.53	1.90	1.52	1.22	1.01
	0.3	2.09	2.14	1.90	1.52	1.22	1.01
	0.2	1.39	1.43	1.47	1.51	1.22	1.01



- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

**WHE**

High-Power Pneumatic Link Clamp

WCE

High-Power Pneumatic Work Support

WNC

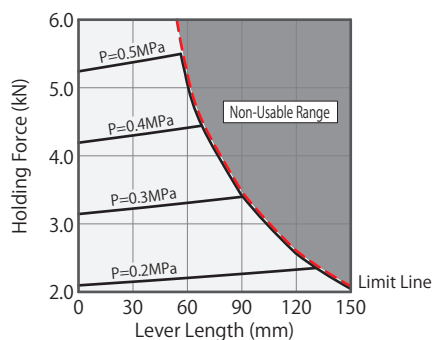
High-Power Pneumatic Pallet Clamp

WVS

## WHE2500

Holding Force Formula <sup>※3</sup> (kN)  $F_k = \frac{10.481 \times P}{1 - 0.0008 \times L}$   
( $F_k \leq$  Limit Line Value)

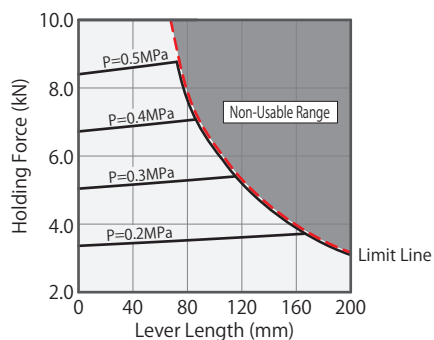
Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (■)					
	Lever Length L (mm)					
	60	80	100	125	150	200
0.5	5.21	3.91	3.12	2.50	2.08	■
0.4	4.40	3.91	3.12	2.50	2.08	1.56
0.3	3.30	3.36	3.12	2.50	2.08	1.56
0.2	2.20	2.24	2.28	2.33	2.08	1.56



## WHE4000

Holding Force Formula <sup>※3</sup> (kN)  $F_k = \frac{16.806 \times P}{1 - 0.0006 \times L}$   
( $F_k \leq$  Limit Line Value)

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range (■)					
	Lever Length L (mm)					
	60	80	100	150	200	250
0.5	8.72	7.92	6.34	4.22	3.17	■
0.4	6.97	7.06	6.34	4.22	3.17	2.53
0.3	5.23	5.30	5.36	4.22	3.17	2.53
0.2	3.49	3.53	3.58	3.69	3.17	2.53

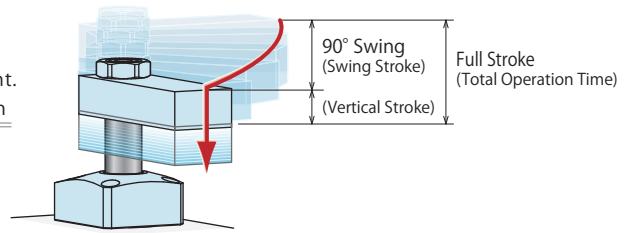


## Allowable Swing Time Graph

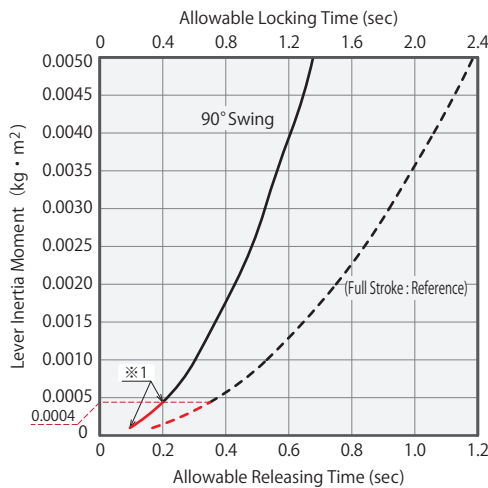
### Adjustment of Swing Time

The graph shows allowable swing time against lever inertia moment. Please make sure that an operation time is more than the operation time shown in the graph.

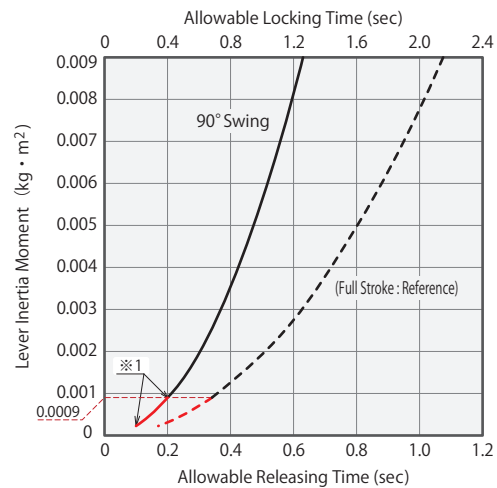
Excessive action speed can reduce stopping accuracy and damage internal parts.



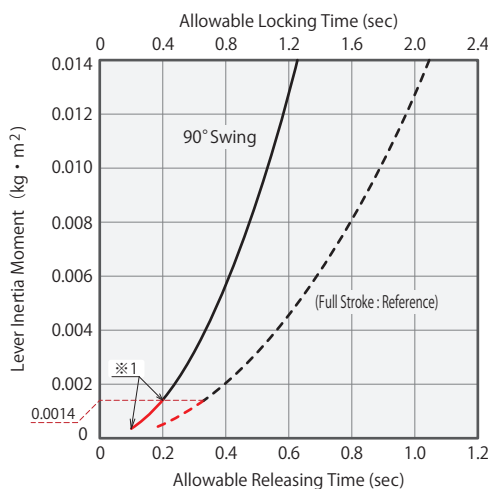
### WHE0600



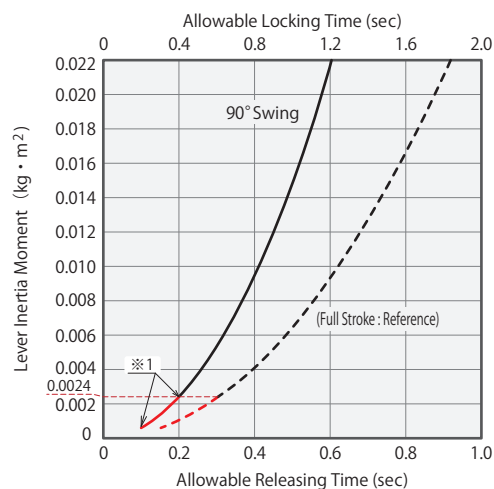
### WHE1000



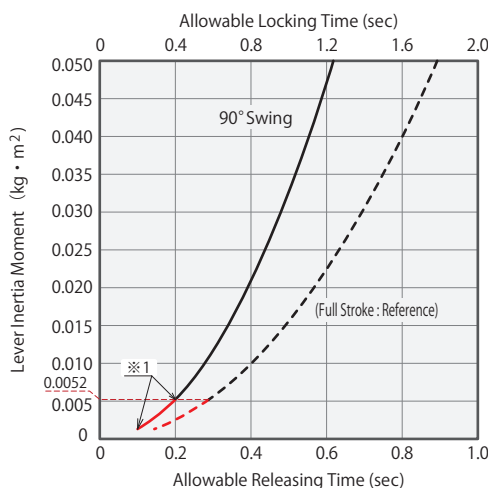
### WHE1600



### WHE2500



### WHE4000



#### Notes

- ※1. For any lever inertia moment, minimum 90° swing time should be 0.2 sec.
- 1. There may be no lever swing action with large inertia depending on supply air pressure, flow and lever mounting position.
- 2. For speed adjustment of clamp lever, please use meter-out flow control valve.  
In case of meter-in control, the clamp lever may be accelerated by its own weight during swinging motion (clamp mounted horizontally) or the piston rod may be moving too fast. Please refer to P.99 for speed adjustment.
- 3. Please contact us if operational conditions differ from those shown on the graphs.

(How to read the allowable swing time graph)

When using WHE1600

Lever Inertia Moment : 0.005 kg·m<sup>2</sup>

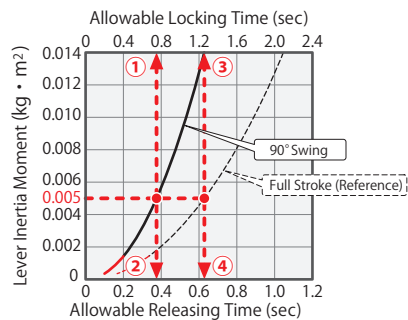
① 90° Swing Time when Locking : About 0.76 sec or more

② 90° Swing Time when Releasing : About 0.38 sec or more

③ Total Lock Operation Time : About 1.27 sec or more

④ Total Release Operation Time : About 0.63 sec or more

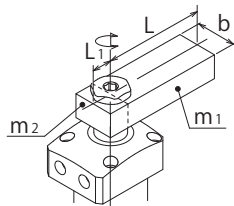
1. The total operation time on the graph represents the allowable operation time when fully stroked.



How to calculate inertia moment (Estimated)

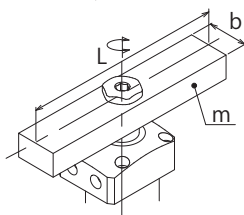
I : Inertia Moment (kg·m<sup>2</sup>)    L, L<sub>1</sub>, L<sub>2</sub>, K, b : Length (m)    m, m<sub>1</sub>, m<sub>2</sub>, m<sub>3</sub> : Mass (kg)

- ① For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.



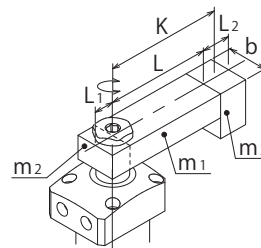
$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}$$

- ② For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.



$$I = m \frac{L^2 + b^2}{12}$$

- ③ The load is applied on the lever front end.



$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12} + m_3 K^2 + m_3 \frac{L_2^2 + b^2}{12}$$

**High-Power Series**

- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

High-Power Hydraulic Swing Clamp

- LHE

High-Power Hydraulic Link Clamp

- LKE

High-Power Pneumatic Hole Clamp

- SWE

**High-Power Pneumatic Swing Clamp**

- WHE**

High-Power Pneumatic Link Clamp

- WCE

High-Power Pneumatic Work Support

- WNC

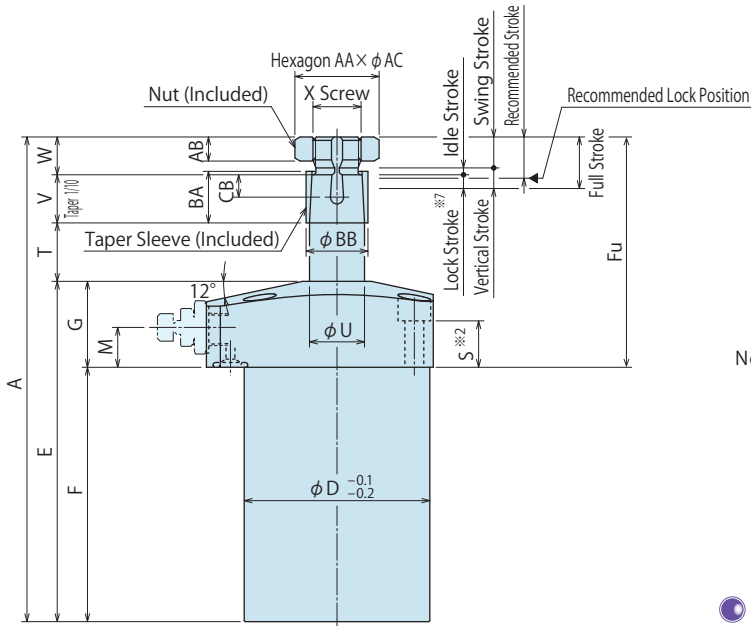
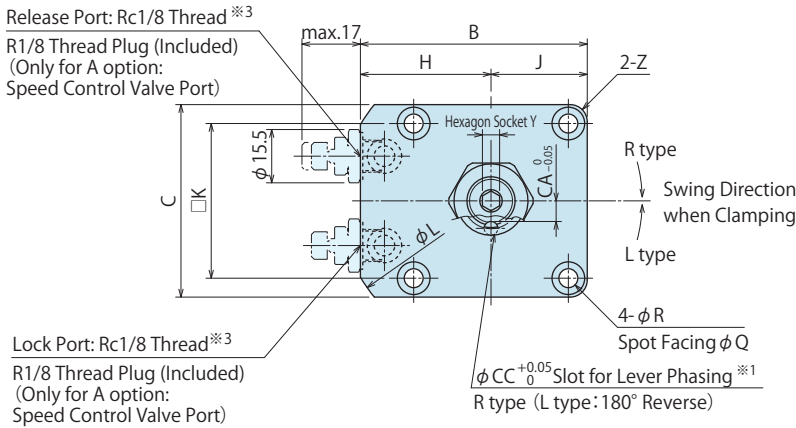
High-Power Pneumatic Pallet Clamp

- WVS

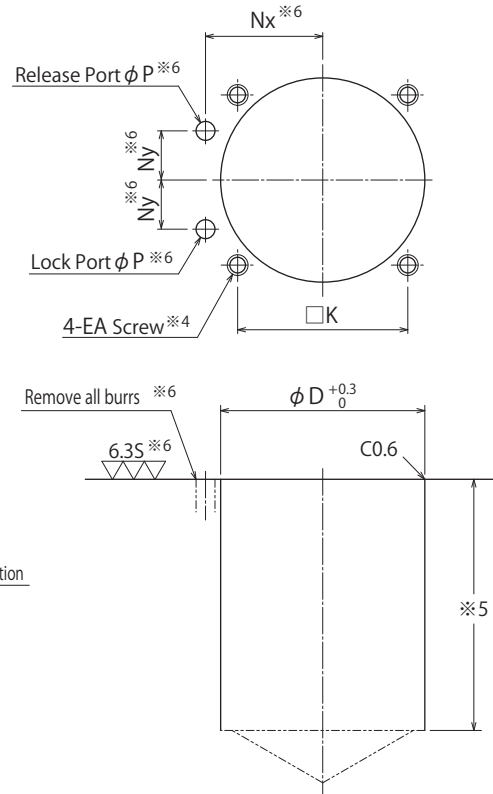
External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)

※The drawing shows the released state of WHE-2AR.



Machining Dimensions of Mounting Area



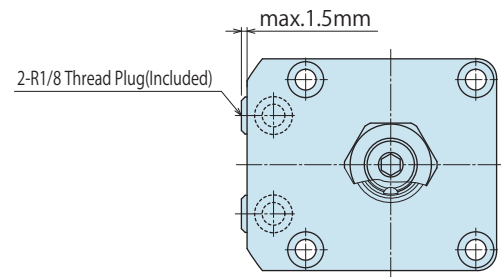
Notes

- ※4. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. The φD depth of the body mounting hole should be decided from dimension F.
- ※6. This process indicates -A/-G: Gasket option.

Piping Method

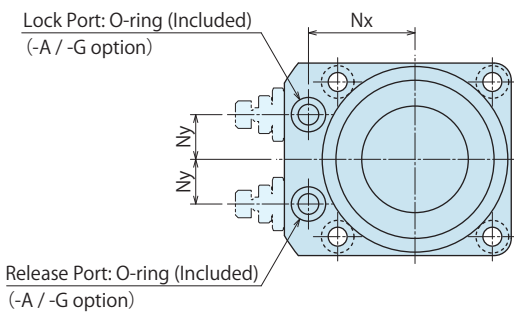
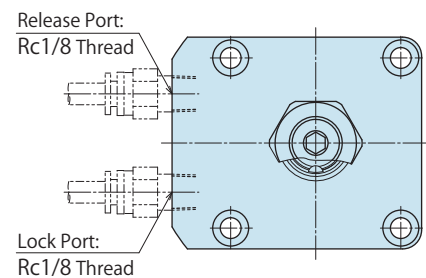
G : Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR.



S : Piping Option (Rc Thread)

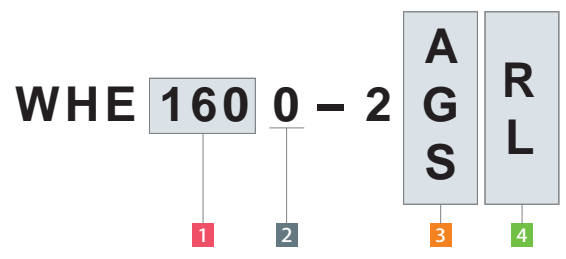
※The drawing shows the released state of WHE-2SR.



Notes

- ※1. The slot for determining the lever phase faces the port side if locked.
- ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※3. Speed control valve is sold separately. Please order separately (see P.213).

### Model No. Indication



(Model No. : WHE1000-2AR, WHE2500-2SL)

- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When Blank is chosen)
- 6 Option (When Blank is chosen)

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

### External Dimensions and Machining Dimensions for Mounting

Model No.	WHE0600-2□□	WHE1000-2□□	WHE1600-2□□	WHE2500-2□□	WHE4000-2□□
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke	6				
(Break   Idle Stroke	2				
down)   Lock Stroke ※7	4				
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
EA (Nominal×Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	Release	15.2	25.5	40.3	69.2
cm <sup>3</sup>					
Mass ※8	kg	0.5	0.8	1.0	1.7
					2.8

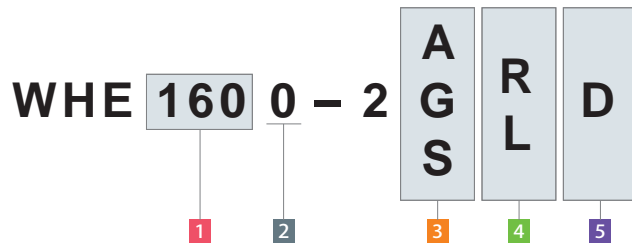
- High-Power Hydraulic Swing Clamp
  - LHE
- High-Power Hydraulic Link Clamp
  - LKE
- High-Power Pneumatic Hole Clamp
  - SWE
- High-Power Pneumatic Swing Clamp
  - WHE
- High-Power Pneumatic Link Clamp
  - WCE
- High-Power Pneumatic Work Support
  - WNC
- High-Power Pneumatic Pallet Clamp
  - WVS

#### Notes

- ※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.  
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
- ※8. Mass of single swing clamp including taper sleeve and nut.



## Model No. Indication



(Model No. : WHE1000-2ARD、WHE2500-2SLD)

- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When D is chosen)
- 6 Option (When Blank is chosen)

## External Dimensions and Machining Dimensions for Mounting

Model No.	WHE0600-2□□D	WHE1000-2□□D	WHE1600-2□□D	WHE2500-2□□D	WHE4000-2□□D
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke	6				
(Break ↓ Idle Stroke	2				
down); Lock Stroke ※6	4				
Recommended Stroke	11	11.5	12	14.5	16.5
A	138	150	156	182	200.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	100.5	104	122.5	133
F	69	75.5	79	92.5	103
Fu	61	64	67	79.5	87.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
DA	8	10.5	10	10	10
DB	21.6	27	31	39	50
DC	8	10	10	12	12
DD (Nominal×Pitch×Depth)	M4×0.7×10	M5×0.8×12	M5×0.8×12	M6×1×15	M6×1×15
DE	6	8	8	10	10
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	Release	14.5	24.4	39.1	67.2
Mass ※7	kg	0.5	0.8	1.0	1.7

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

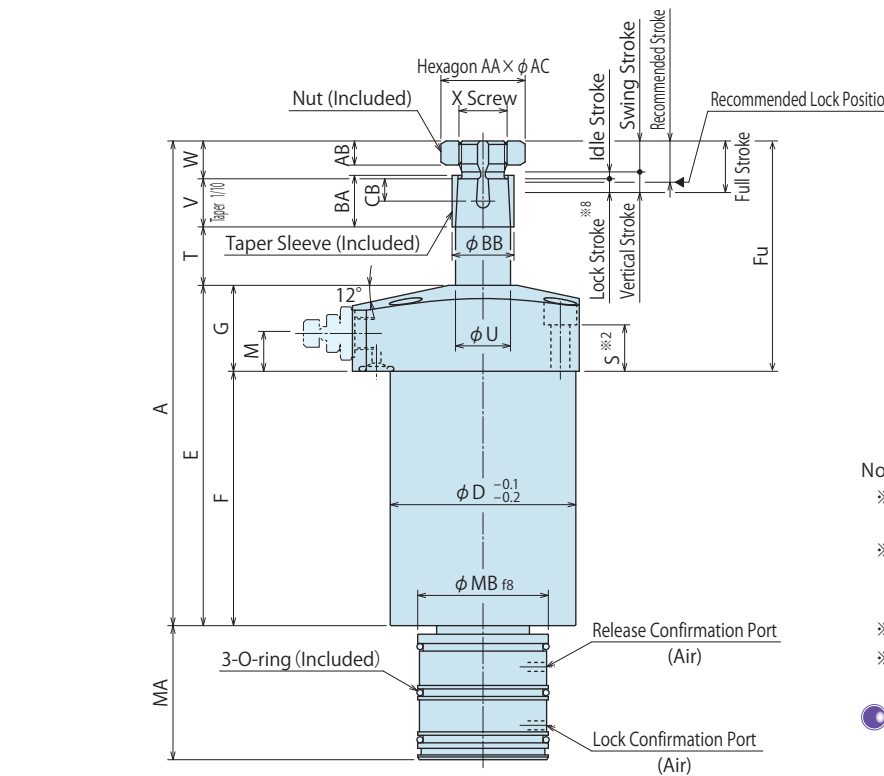
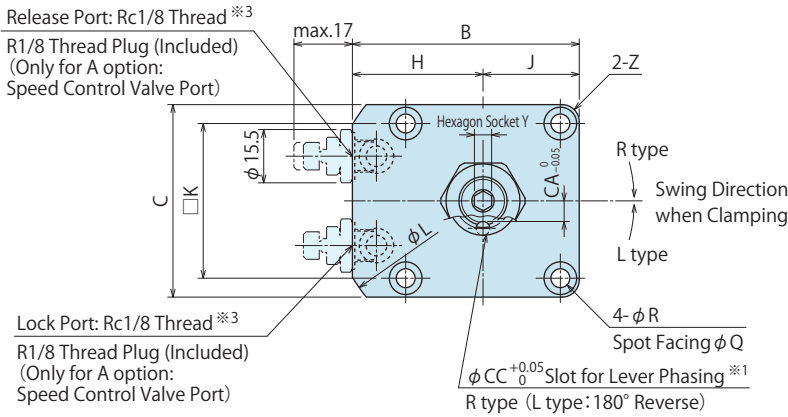
- High-Power Hydraulic Swing Clamp
  - LHE
- High-Power Hydraulic Link Clamp
  - LKE
- High-Power Pneumatic Hole Clamp
  - SWE
- High-Power Pneumatic Swing Clamp
  - WHE
- High-Power Pneumatic Link Clamp
  - WCE
- High-Power Pneumatic Work Support
  - WNC
- High-Power Pneumatic Pallet Clamp
  - WVS

Notes ※6. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.  
 (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)  
 ※7. Mass of single swing clamp including taper sleeve and nut.

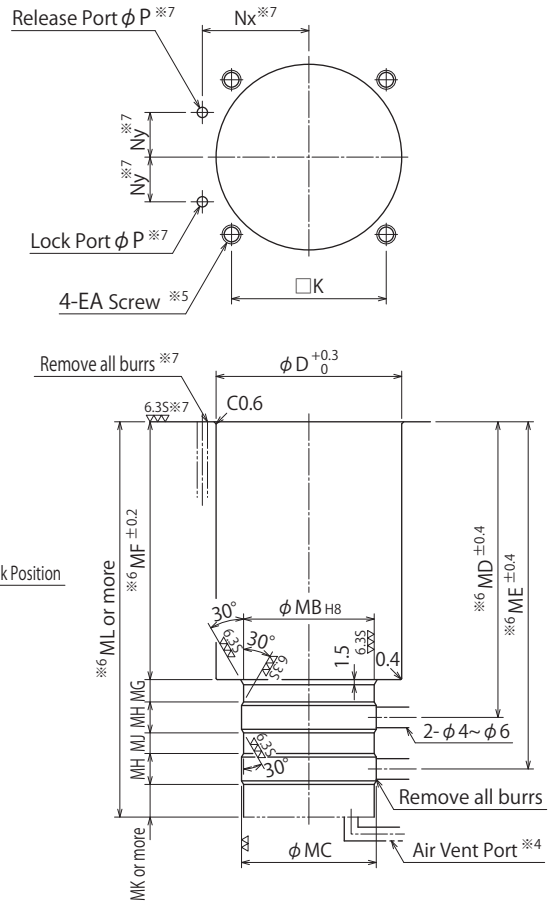


External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)  
 ※The drawing shows the released state of WHE-2ARM.



Machining Dimensions of Mounting Area

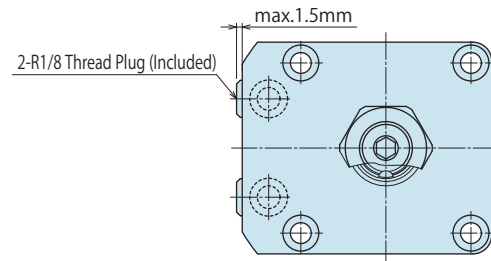
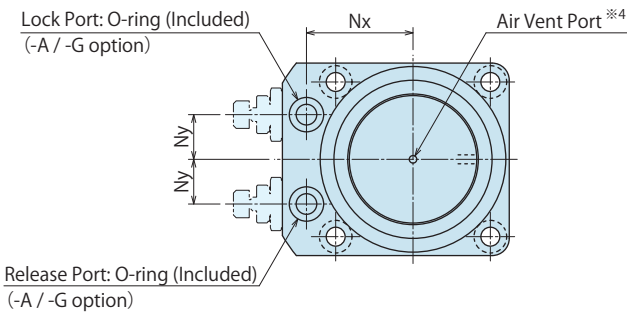


- Notes
- ※4. Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris.
  - ※5. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
  - ※6. The dimensions indicate those under the flange.
  - ※7. This process indicates -A/-G: Gasket option.

Piping Method

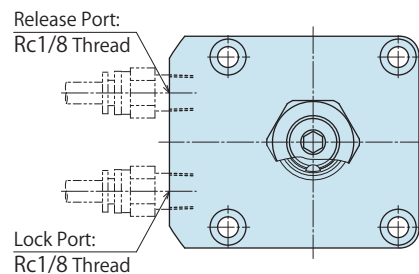
G : Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GRM.



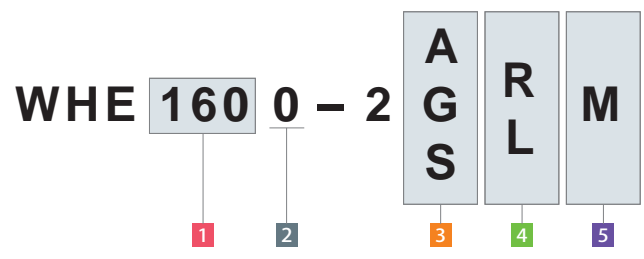
S : Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SRM.



- Notes
- ※1. The slot for determining the lever phase faces the port side if locked.
  - ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
  - ※3. Speed control valve is sold separately. Please order separately (see P.213).
    - Please contact us when you require options in combination.
    - Please refer to P.95~P.96 about air sensing chart.

### Model No. Indication



(Model No. : WHE1000-2ARM, WHE2500-2SLM)

- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When M is chosen)
- 6 Option (When Blank is chosen)

### External Dimensions and Machining Dimensions for Mounting

Model No.	WHE0600-2□□M	WHE1000-2□□M	WHE1600-2□□M	WHE2500-2□□M	WHE4000-2□□M
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke	6				
(Break / Idle Stroke down) Lock Stroke ※7	2				
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
MA	36	39	39	44	44
MB f8	28 -0.020 / -0.053	38 -0.025 / -0.064	38 -0.025 / -0.064	45 -0.025 / -0.064	45 -0.025 / -0.064
MB H8	28 +0.033 / 0	38 +0.039 / 0	38 +0.039 / 0	45 +0.039 / 0	45 +0.039 / 0
MC	29.2	39.2	39.2	46.2	46.2
MD	75.5	82.5	86	100	110.5
ME	88.5	97.5	101	118.5	129
MF	65	71.5	75	88.5	99
MG	6	6.5	6.5	7	7
MH	9	9	9	9	9
MJ	4	6	6	9.5	9.5
MK	9	9.5	9.5	10.5	10.5
ML	102	111.5	115	133.5	144
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
3-O-ring	AS568-021 (70°)	AS568-028 (70°)	AS568-028 (70°)	AS568-030 (70°)	AS568-030 (70°)
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	Release	14.5	24.4	39.1	67.2
Mass ※9	kg	0.6	1.0	1.2	2.0

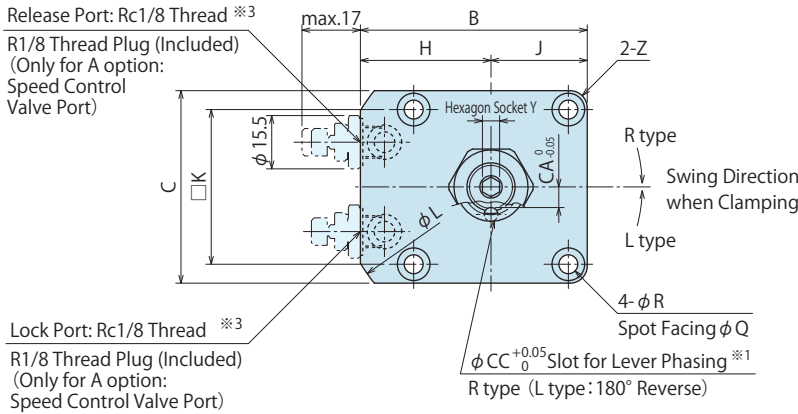
Notes ※8. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.  
 (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)  
 ※9. Mass of single swing clamp including taper sleeve and nut.

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others
- High-Power Hydraulic Swing Clamp
- LHE
- High-Power Hydraulic Link Clamp
- LKE
- High-Power Pneumatic Hole Clamp
- SWE
- High-Power Pneumatic Swing Clamp
- WHE
- High-Power Pneumatic Link Clamp
- WCE
- High-Power Pneumatic Work Support
- WNC
- High-Power Pneumatic Pallet Clamp
- WVS

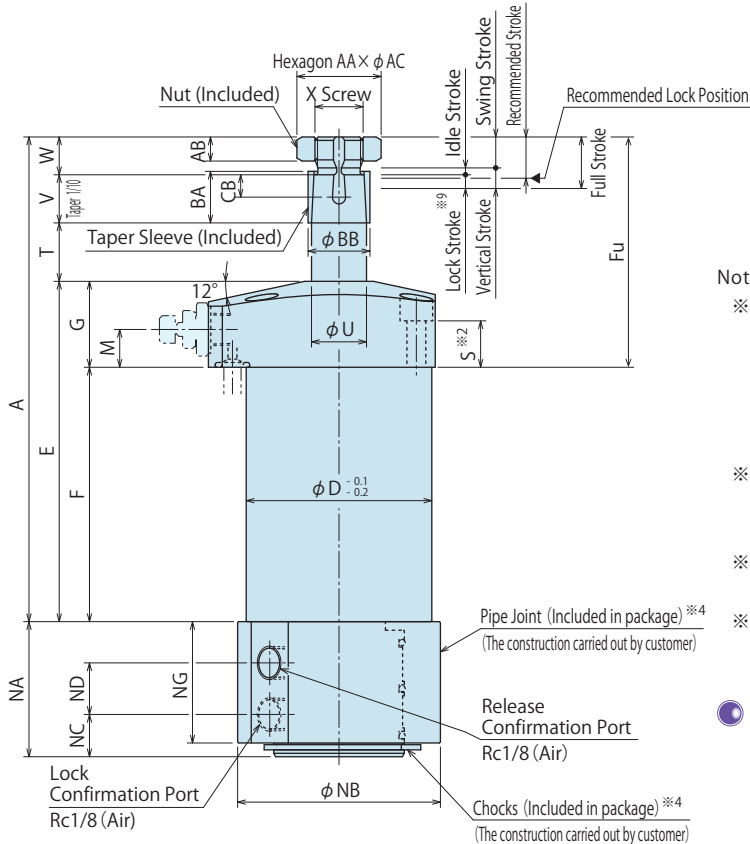
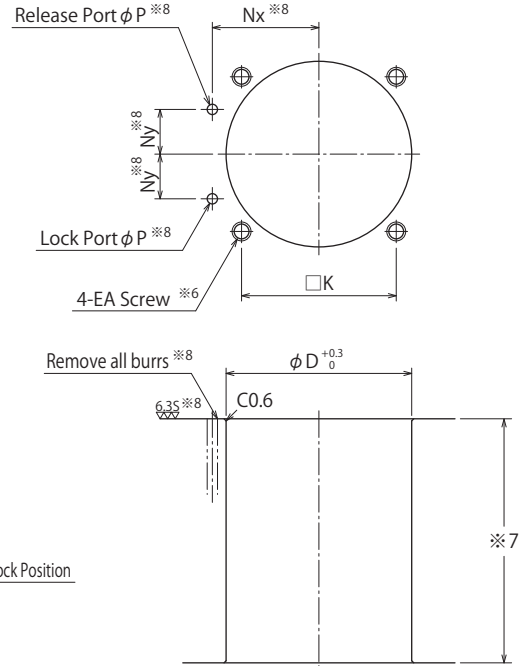
External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)

※ This drawing shows the released state (Pipe joint mounted condition) of (WHE-2ARN).



Machining Dimensions of Mounting Area



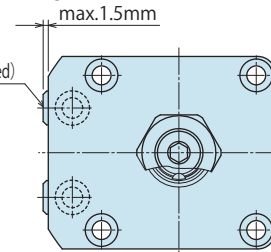
Notes

- ※5. Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris. If the port might be exposed to coolant or debris a filter mechanism should be attached using tapped holes M3 screw. Be sure not to block the air vent port.
- ※6. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※7. The φ D depth of the body mounting hole should be F or less dimension.
- ※8. This process indicates -A/-G: Gasket option.

Piping Method

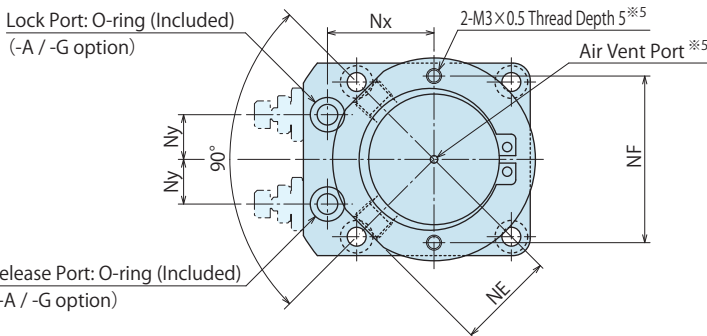
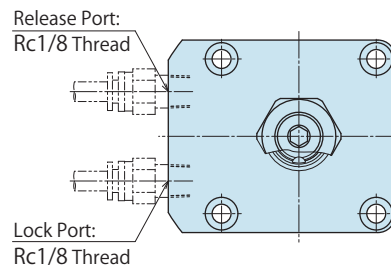
G : Gasket Option (with R Thread Plug)

※ The drawing shows the released state of WHE-2GRN.



S : Piping Option (Rc Thread)

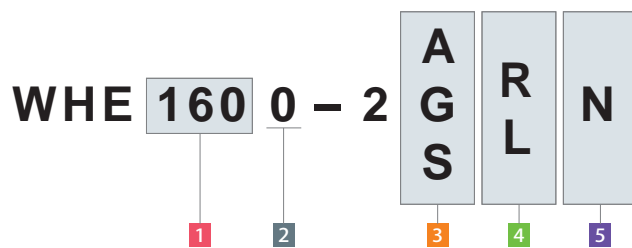
※ The drawing shows the released state of WHE-2SRN.



Notes

- ※1. The slot for determining the lever phase faces the port side if locked.
- ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※3. Speed control valve is sold separately. Please order separately (see P.213).
- ※4. We bundle it and ship plumbing joint and chocks without attaching it. Please attach plumbing joint and chocks with caution in order of, ① plumbing joint, ② chocks not to damage an O-ring from a cylinder bottom. (The plumbing joint does the M3 screw side downward, and, please attach it.)
  1. Please contact us when you require options in combination.
  2. Please refer to P.95 ~ P.96 about air sensing chart.

## Model No. Indication



(Model No. : WHE1000-2ARN、WHE2500-2SLN)

- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When N is chosen)
- 6 Option (When Blank is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□N	WHE1000-2□□N	WHE1600-2□□N	WHE2500-2□□N	WHE4000-2□□N
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke					
(Break ; Idle Stroke					
down) ; Lock Stroke <sup>※9</sup>					
Recommended Stroke	11	11.5	12	14.5	16.5
A	125	134.5	141	167	185.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	61	64	67	79.5	87.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
T	16	16.5	17	19.5	21.5
U	12	14	16	20	25
V	10	12	14	17	21
W	10	10.5	11	13	15
X (Nominal × Pitch)	M10×1	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	4	5	5	6	8
Z (Chamfer)	C3	R5	R5	R6	R6
AA	17	19	22	24	32
AB	6	6.5	7	8	10
AC	19	21.2	24.5	26.5	35.5
BA	11	13	15	18	22
BB	14	16	18	22	28
CA	4.5	5	6	8	10
CB	4.5	4.5	6.5	5.5	9.5
CC	3	4	4	4	6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
NA	36	39	39	44	44
NB	49	59	59	66	66
NC	11.5	12	12	13	13
ND	13	15	15	18.5	18.5
NE	23.5	28.5	28.5	32	32
NF	38	48	48	55	55
NG	32.6	35.3	35.3	40.3	40.3
Chocks (Included in package)	STW-28	STW-38	STW-38	STW-45	STW-45
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	Release	14.5	24.4	39.1	67.2
Mass <sup>※10</sup> kg	0.7	1.0	1.2	2.0	3.1

### Notes

※9. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.

(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

※10. Mass of single swing clamp including taper sleeve and nut.

### High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

High-Power Hydraulic Swing Clamp

LHE

High-Power Hydraulic Link Clamp

LKE

High-Power Pneumatic Hole Clamp

SWE

High-Power Pneumatic Swing Clamp

WHE

High-Power Pneumatic Link Clamp

WCE

High-Power Pneumatic Work Support

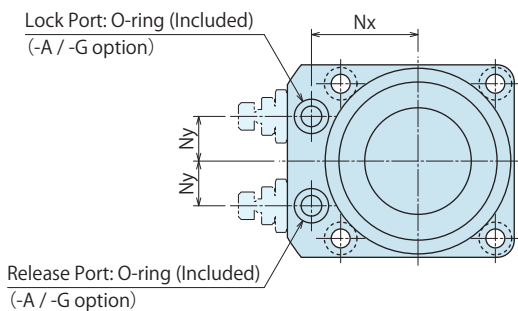
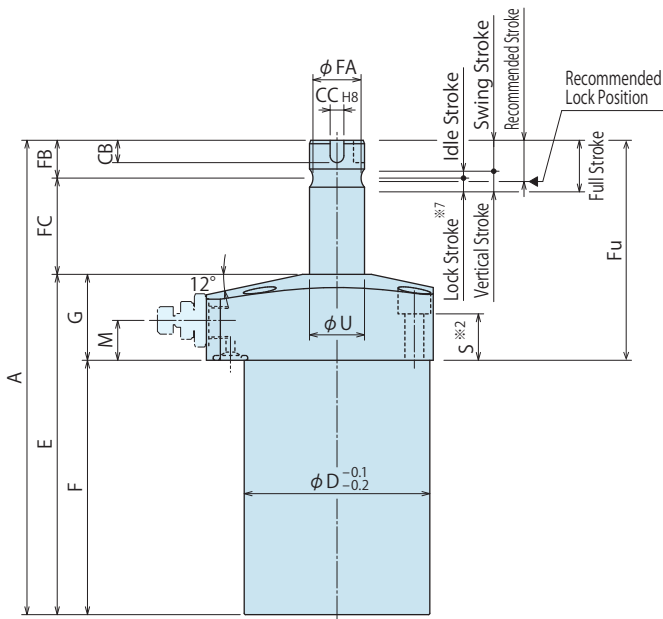
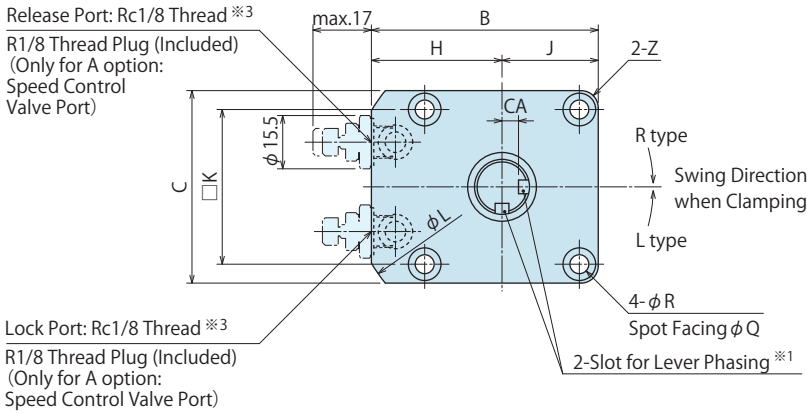
WNC

High-Power Pneumatic Pallet Clamp

WVS

External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)  
 ※The drawing shows the released state of WHE-2AL-F.

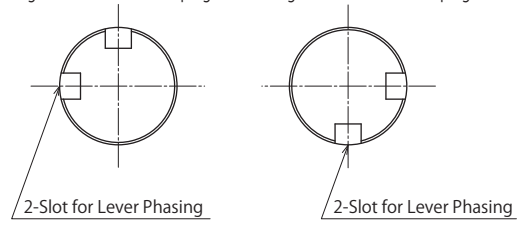


Notes

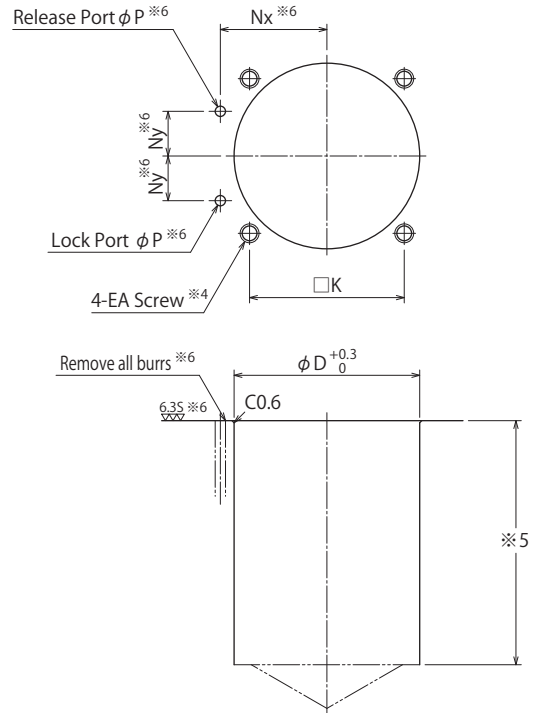
- ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※3. Speed control valve is sold separately. Please order separately (see P.213).
- 1. Please contact us when you require options in combination.

※1. Slot for Lever Phasing (Released State)

The slot position varies as per the lock swinging direction.  
 Swing Direction when Clamping : R Swing Direction when Clamping : L



Machining Dimensions of Mounting Area



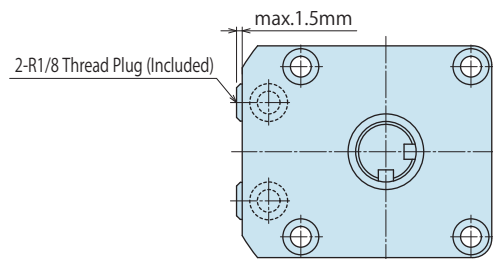
Notes

- ※4. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. The φD depth of the body mounting hole should be decided from dimension F.
- ※6. This process indicates -A/-G :Gasket option.

Piping Method

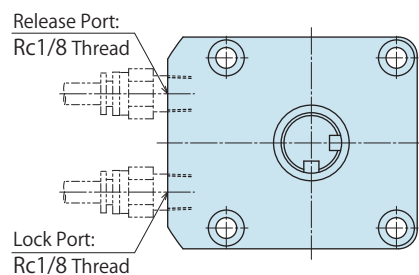
G : Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GL-F.



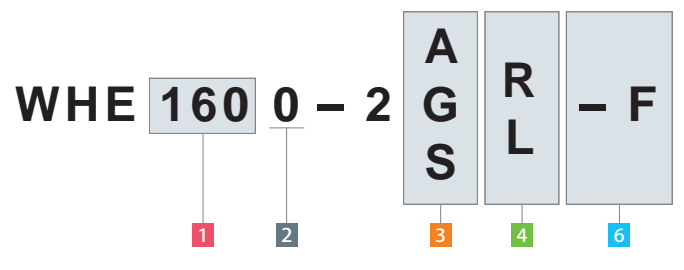
S : Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SL-F.



### Model No. Indication

(Model No. : WHE1000-2AR-F, WHE2500-2SL-F)



- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When Blank is chosen)
- 6 Option (When F is chosen)

### External Dimensions and Machining Dimensions for Mounting

Model No.	WHE0600-2□□-F	WHE1000-2□□-F	WHE1600-2□□-F	WHE2500-2□□-F	WHE4000-2□□-F
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke	6				
(Break ; Idle Stroke down) ; Lock Stroke ※7	2				
Recommended Stroke	11	11.5	12	14.5	16.5
A	121	131	138	167	183.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	57	60.5	64	79.5	85.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
U	12	14	16	20	25
Z (Chamfer)	C3	R5	R5	R6	R6
CA	4	4.5	4.8	6.8	9
CB	4.25	5	6.5	6.5	7
CC	2.5 <sup>+0.014</sup> / <sub>0</sub>	3 <sup>+0.014</sup> / <sub>0</sub>	4 <sup>+0.018</sup> / <sub>0</sub>	4 <sup>+0.018</sup> / <sub>0</sub>	4 <sup>+0.018</sup> / <sub>0</sub>
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
FA	10.5	12.5	14	17.5	22
FB	8	9.5	11	15	17
FC	24	26	28	34.5	38.5
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	Release	15.2	25.5	40.3	69.2
Mass ※8	kg	0.5	0.8	1.0	1.7

Notes

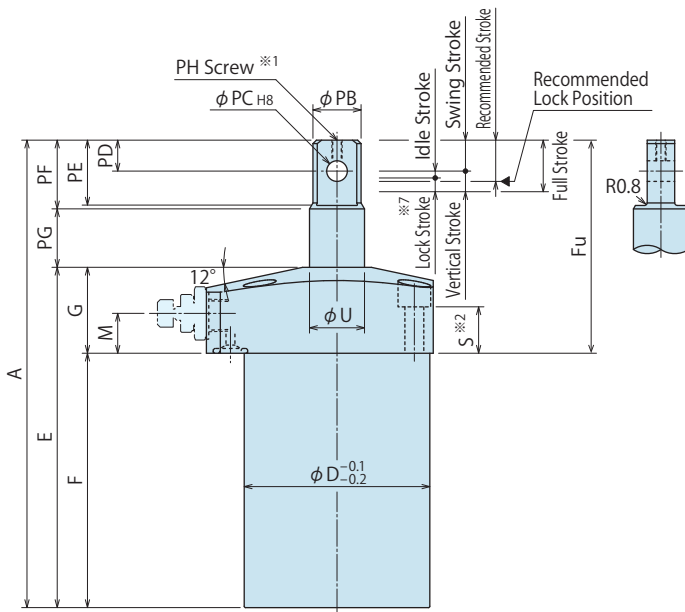
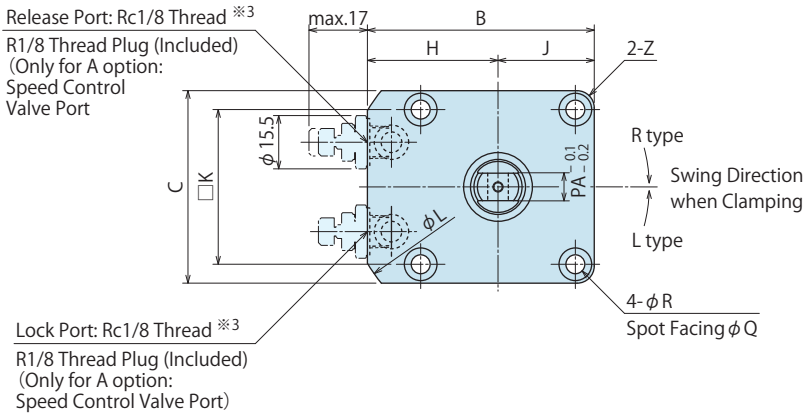
- ※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.  
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
- ※8. Mass of single swing clamp including taper sleeve and nut.

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

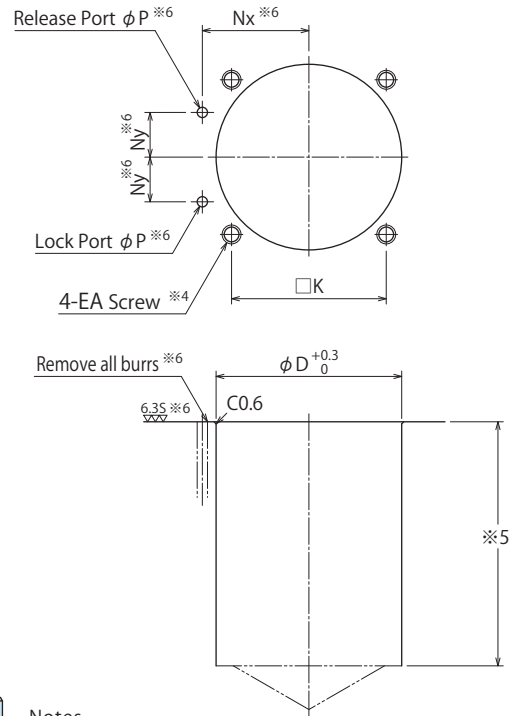
- High-Power Hydraulic Swing Clamp
- LHE
- High-Power Hydraulic Link Clamp
- LKE
- High-Power Pneumatic Hole Clamp
- SWE
- High-Power Pneumatic Swing Clamp
- WHE
- High-Power Pneumatic Link Clamp
- WCE
- High-Power Pneumatic Work Support
- WNC
- High-Power Pneumatic Pallet Clamp
- WVS

External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)  
 ※The drawing shows the released state of WHE-2AR-P.



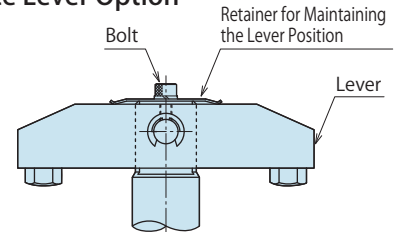
Machining Dimensions of Mounting Area



Notes

- ※4. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. The φD depth of the body mounting hole should be decided from dimension F.
- ※6. This process indicates -A/-G:Gasket option.

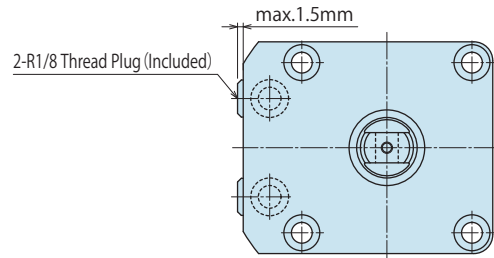
Balance Lever Option



Piping Method

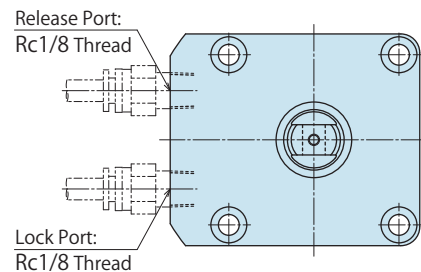
G : Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR-P.



S : Piping Option (Rc Thread)

※The drawing shows the released state of WHE-2SR-P.



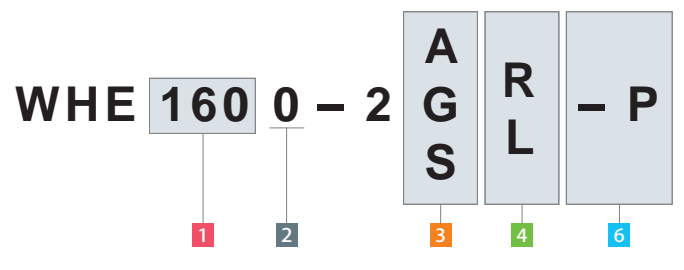
Notes

- ※1. Use the tapped hole (PH thread) on top of rod to attach retainer for lever.
  - ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
  - ※3. Speed control valve is sold separately. Please order separately (see P.213).
1. Please contact us when you require options in combination.



### Model No. Indication

(Model No. : WHE1000-2AR-P, WHE2500-2SL-P)



- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When Blank is chosen)
- 6 Option (When P is chosen)

### External Dimensions and Machining Dimensions for Mounting

Model No.	WHE0600-2□□-P	WHE1000-2□□-P	WHE1600-2□□-P	WHE2500-2□□-P	WHE4000-2□□-P
Full Stroke	14	14.5	15	17.5	19.5
Swing Stroke (90°)	8	8.5	9	11.5	13.5
Vertical Stroke	6				
(Break ; Idle Stroke down) ; Lock Stroke <sup>※7</sup>	2				
Recommended Stroke	11	11.5	12	14.5	16.5
A	120	131	138	167	183.5
B	54	60	66	76	87
C	45	50	56	66	78
D	40	46	54	64	77
E	89	95.5	99	117.5	128
F	64	70.5	74	87.5	98
Fu	56	60.5	64	79.5	85.5
G	25	25	25	30	30
H	31.5	35	38	43	48
J	22.5	25	28	33	39
K	34	39	45	53	65
L	72	79	88	98	113
M	11	11	11	13	13
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	max. φ3	max. φ5	max. φ5	max. φ5	max. φ5
Q	9.5	9.5	9.5	11	11
R	5.5	5.5	5.5	6.8	6.8
S	15.5	14	13.5	16	15
U	12	14	16	20	25
Z (Chamfer)	C3	R5	R5	R6	R6
EA (Nominal × Pitch)	M5×0.8	M5×0.8	M5×0.8	M6×1	M6×1
PA	6	7	8	10	12
PB	10	12	14	18	23
PC	4 <sup>+0.018</sup> <sub>0</sub>	5 <sup>+0.018</sup> <sub>0</sub>	6 <sup>+0.018</sup> <sub>0</sub>	8 <sup>+0.022</sup> <sub>0</sub>	10 <sup>+0.022</sup> <sub>0</sub>
PD	6.5	8.5	9	12	12.5
PE	14	18	21	27.5	31.5
PF	15	19	22	29	33
PG	16	16.5	17	20.5	22.5
PH (Nominal × Pitch)	M3×0.5	M3×0.5	M3×0.5	M4×0.7	M5×0.8
O-ring (-A/-G option)	1BP5	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity	Lock	12.8	21.8	35.5	61.3
	cm <sup>3</sup> Release	15.2	25.5	40.3	69.2
Mass <sup>※8</sup> kg	0.5	0.8	1.0	1.7	2.8

Notes

- ※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.  
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
- ※8. Mass of single swing clamp including taper sleeve and nut.

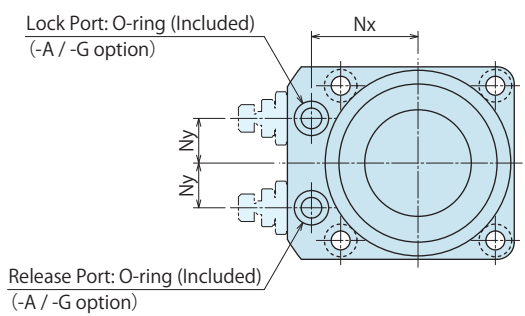
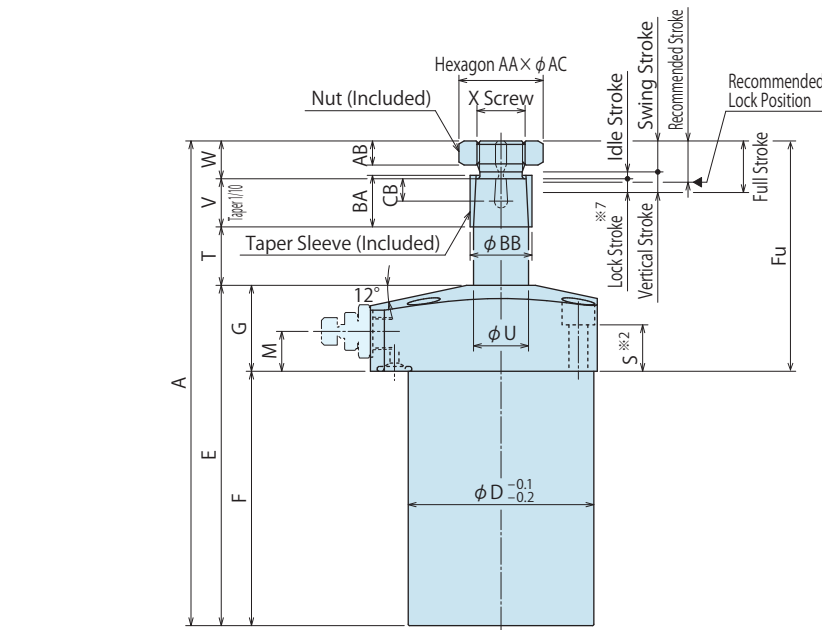
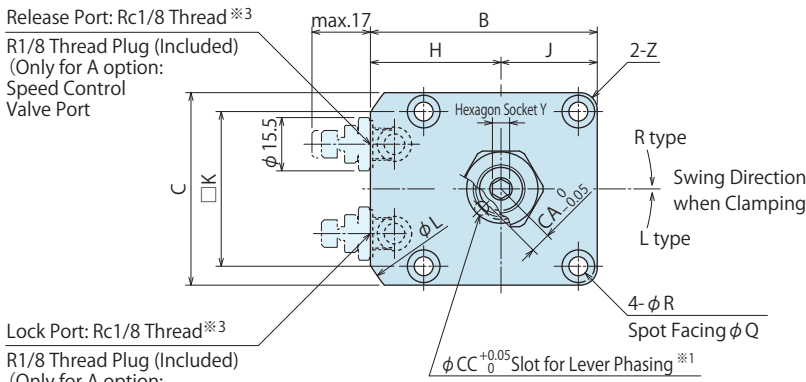
- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

- High-Power Hydraulic Swing Clamp
  - LHE
- High-Power Hydraulic Link Clamp
  - LKE
- High-Power Pneumatic Hole Clamp
  - SWE
- High-Power Pneumatic Swing Clamp
  - WHE
- High-Power Pneumatic Link Clamp
  - WCE
- High-Power Pneumatic Work Support
  - WNC
- High-Power Pneumatic Pallet Clamp
  - WVS



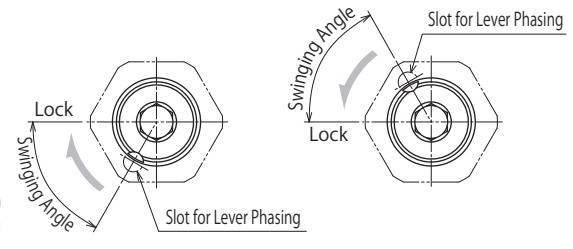
External Dimensions

A : Gasket Option Speed Control Valve Corresponding Option (Include R-Thread Plug)  
 ※The drawing shows the released state of WHE-2AR-Y45.

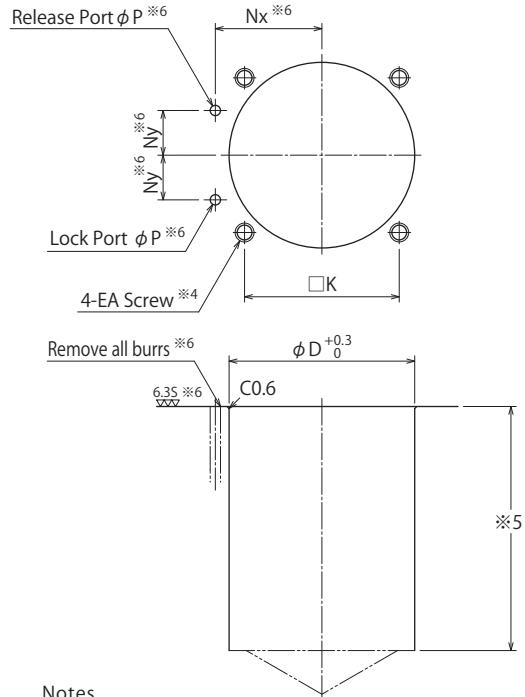


※1. Slot for Lever Phasing (Released State)

The slot position varies depending on the lock swinging direction and swinging angle.  
 Swing Direction when Clamping : R Swing Direction when Clamping : L



Machining Dimensions of Mounting Area

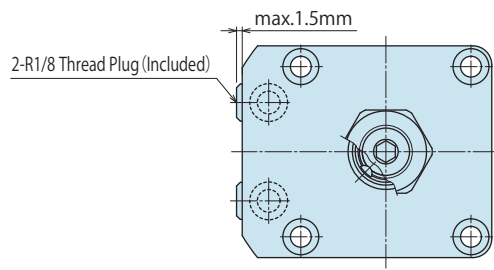


- Notes
- ※4. EA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
  - ※5. The depth of diameter D for the mounting hole on the unit should be decided by customer according to the mounting height using the F dimensions as a reference.
  - ※6. This process indicates -A/-G : Gasket option.

Piping Method

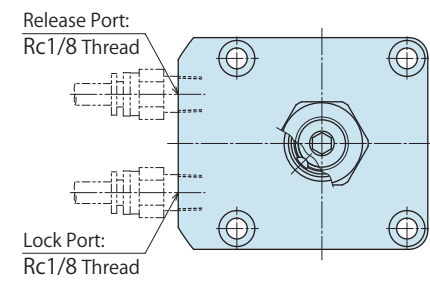
G : Gasket Option (with R Thread Plug)

※The drawing shows the released state of WHE-2GR-Y45.



S : Piping Option (Rc Thread)

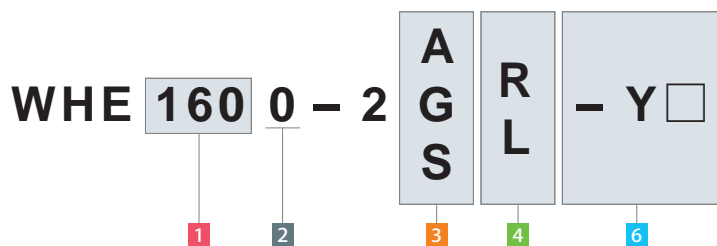
※The drawing shows the released state of WHE-2SR-Y45.



- Notes
- ※1. The slot for determining the lever phase faces the port side if locked
  - ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
  - ※3. Speed control valve is sold separately. Please order separately (see P.213).
  - 1. Please contact us when you require options in combination.

## Model No. Indication

(Model No. : WHE1000-2AR-Y45、WHE2500-2SL-Y45)



- 1 Cylinder Force
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Action Confirmation (When Blank is chosen)
- 6 Option (When Y is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHE0600-2□□-Y□			WHE1000-2□□-Y□			WHE1600-2□□-Y□			WHE2500-2□□-Y□			WHE4000-2□□-Y□					
Option Code	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60			
Swing Angle	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°			
Full Stroke	9.6	10.7	11.8	10.5	11.5	12.5	11.1	12	13	13	14.1	15.3	14	15.3	16.7			
Swing Stroke	3.6	4.7	5.8	4.5	5.5	6.5	5.1	6	7	7	8.1	9.3	8	9.3	10.7			
Vertical Stroke	6																	
(Break down) Idle Stroke	2																	
(Break down) Lock Stroke <sup>※7</sup>	4																	
Recommended Stroke	6.6	7.7	8.8	7.5	8.5	9.5	8.1	9	10	10	11.1	12.3	11	12.3	13.7			
A	120.6	121.7	122.8	130.5	131.5	132.5	137.1	138	139	162.5	163.6	164.8	180	181.3	182.7			
B	54			60			66			76			87					
C	45			50			56			66			78					
D	40			46			54			64			77					
E	89			95.5			99			117.5			128					
F	64			70.5			74			87.5			98					
Fu	56.6	57.7	58.8	60	61	62	63.1	64	65	75	76.1	77.3	82	83.3	84.7			
G	25			25			25			30			30					
H	31.5			35			38			43			48					
J	22.5			25			28			33			39					
K	34			39			45			53			65					
L	72			79			88			98			113					
M	11			11			11			13			13					
Nx	26			28			31			36			41					
Ny	9			10			13			15			20					
P	max. φ3			max. φ5			max. φ5			max. φ5			max. φ5					
Q	9.5			9.5			9.5			11			11					
R	5.5			5.5			5.5			6.8			6.8					
S	15.5			14			13.5			16			15					
T	11.6	12.7	13.8	12.5	13.5	14.5	13.1	14	15	15	16.1	17.3	16	17.3	18.7			
U	12			14			16			20			25					
V	10			12			14			17			21					
W	10			10.5			11			13			15					
X (Nominal × Pitch)	M10×1			M12×1.5			M14×1.5			M16×1.5			M22×1.5					
Y	4			5			5			6			8					
Z (Chamfer)	C3			R5			R5			R6			R6					
AA	17			19			22			24			32					
AB	6			6.5			7			8			10					
AC	19			21.2			24.5			26.5			35.5					
BA	11			13			15			18			22					
BB	14			16			18			22			28					
CA	4.5			5			6			8			10					
CB	4.5			4.5			6.5			5.5			9.5					
CC	3			4			4			4			6					
EA (Nominal × Pitch)	M5×0.8			M5×0.8			M5×0.8			M6×1			M6×1					
O-ring (-A/-G option)	1BP5			1BP7			1BP7			1BP7			1BP7					
Cylinder Capacity	Lock	10.4	11.0	11.6	18.1	19.0	20.0	30.1	31.3	32.7	52.0	54.3	56.8	86.5	90.6	95.0		
	Release	12.1	12.9	13.7	21.2	22.2	23.3	34.1	35.5	37.1	58.5	61.1	64.0	97.6	102.3	107.4		
Mass <sup>※8</sup>	kg			0.5			0.8			1.0			1.7			2.8		

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others
- High-Power Hydraulic Swing Clamp
- LHE
- High-Power Hydraulic Link Clamp
- LKE
- High-Power Pneumatic Hole Clamp
- SWE
- High-Power Pneumatic Swing Clamp
- WHE
- High-Power Pneumatic Link Clamp
- WCE
- High-Power Pneumatic Work Support
- WNC
- High-Power Pneumatic Pallet Clamp
- WVS

### Notes

※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.

(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

※8. Mass of single swing clamp including taper sleeve and nut.

## ● Air Sensing Option (Action Confirmation Method · · · M : Air Sensing Manifold Option / N : Air Sensing Piping Option)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor connected to lock confirmation port and release confirmation port.

Applicable Model

**WHE 160 0 - 2**



5 Action Confirmation Method  
: When M/N is chosen

### About Air Catch Sensor

**The essential condition: Air catch sensor that have a consumption rate more than 22~25L/min(at 0.2 MPa) is needed.**

Recommended Operating Air Pressure : 0.2 MPa

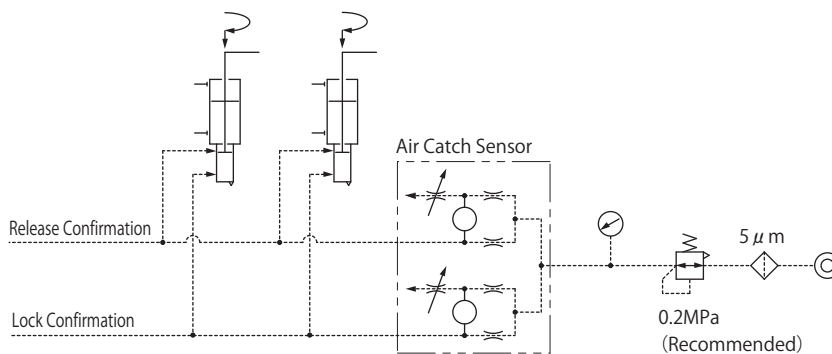
Recommended Air Catch Sensor

Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA1, ISA2-H	GPS2-07-15

In order to carry out stabilized detection, the number of clamps connected per one air catch sensor should be no more than 4.

The air pressure to the air catch sensor should be 0.2MPa.

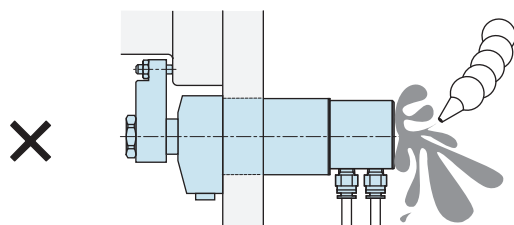
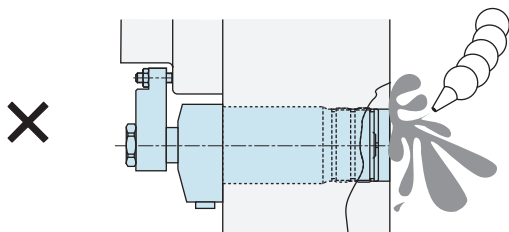
Refer to the drawing below for the pneumatic circuit composition.



### Notes for Use and Installation

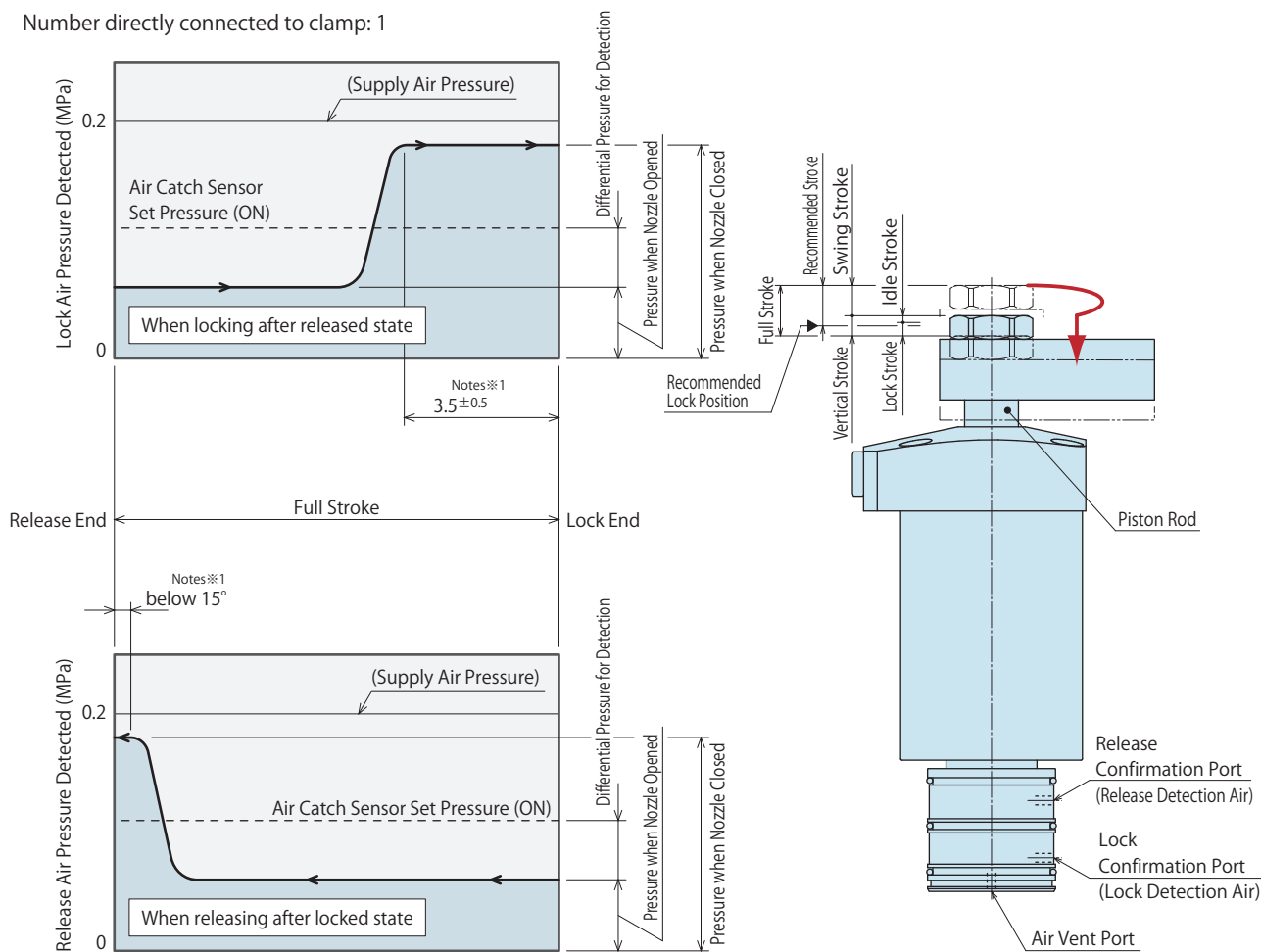
- Air venting port must be open to the atmosphere and kept free of coolant, chips or other debris. The air catch sensor can malfunction if the air vent port is blocked.

- Grease the O-ring before assembly to fixture. If it is mounted under dry state, the O-ring may have twisting or be defective. If excessive grease is applied, the grease may overflow to block the detection port, resulting in malfunctioning of the air catch sensor.



**Air Sensing Chart**

Number directly connected to clamp: 1

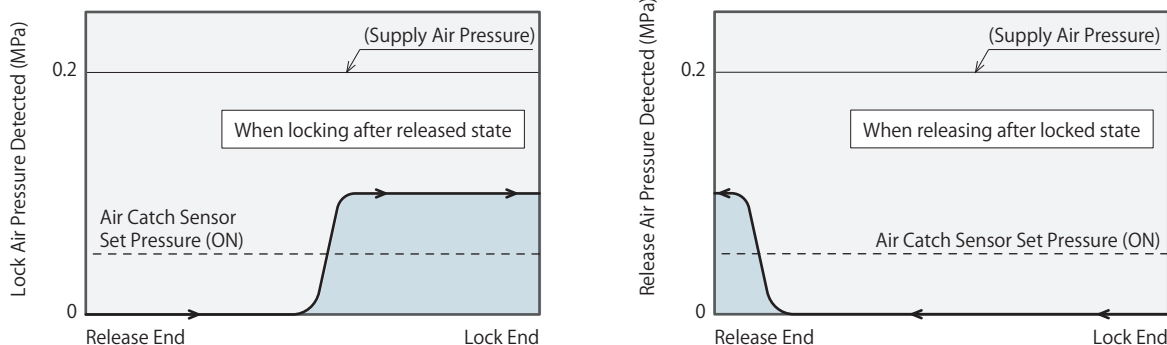


**Notes**

1. Sensing chart shown is the relationship between the stroke and detection circuit air pressure.
  2. The position where the air catch sensor has ON signal output varies as per the sensor setting.
  3. The detection pressure varies depending on the number of clamps connected per circuit. (Maximum number of clamps connected: 4)
  4. The features may vary depending on the air circuit structure. Please contact us for further information.
- ※1. There is a certain tolerance with regard to the position where the pressure for fully closing the detection nozzle is reached depending on the clamp structure. (Refer to the sensing chart.)

Model No.	WHE0600-2□□M/N	WHE1000-2□□M/N	WHE1600-2□□M/N	WHE2500-2□□M/N	WHE4000-2□□M/N	
Full Stroke	mm	14	14.5	15	17.5	19.5

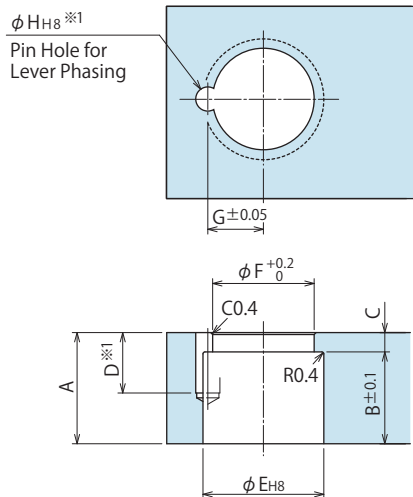
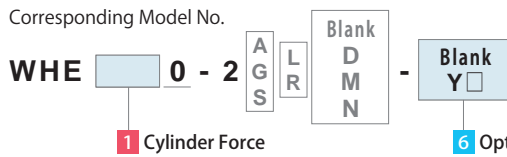
Number directly connected to clamp: 4 (for reference)



### Taper Lock Lever Design Dimensions

※ Reference for designing taper lock swing lever.

Corresponding Model No.



Corresponding Model No.	WHE0600-2□□□	WHE1000-2□□□	WHE1600-2□□□	WHE2500-2□□□	WHE4000-2□□□
A	14	16	18	22	26
B	11	13	15	18	22
C	3	3	3	4	4
D	8.5	8.5	10.5	10.5	14.5
E	$14^{+0.027}_0$	$16^{+0.027}_0$	$18^{+0.027}_0$	$22^{+0.033}_0$	$28^{+0.033}_0$
F	11	13	15	17	23.5
G	6	7.1	8.1	10.1	13.1
H	$3^{+0.014}_0$	$4^{+0.018}_0$	$4^{+0.018}_0$	$4^{+0.018}_0$	$6^{+0.018}_0$
Phasing Pin (Reference)※2	$\phi 3(h8) \times 8$	$\phi 4(h8) \times 8$	$\phi 4(h8) \times 10$	$\phi 4(h8) \times 10$	$\phi 6(h8) \times 14$

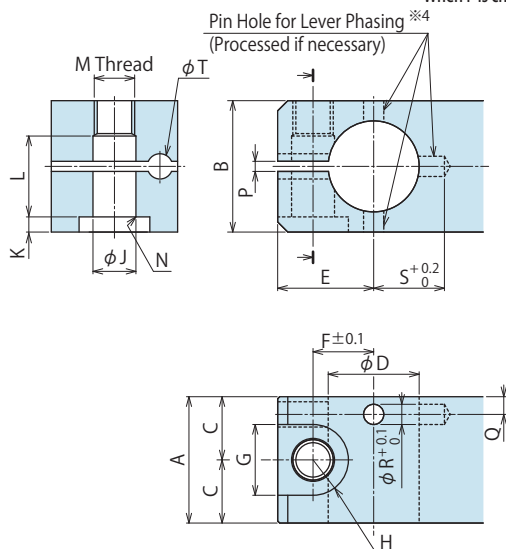
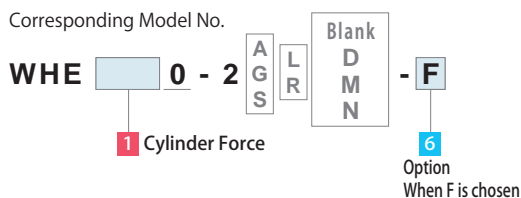
Notes

- Swing lever should be designed with its length according to performance graph.
  - If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.
- ※1. The pin hole for lever phasing ( $\phi H$ ) should be added if necessary.  
 ※2. The pin for lever phasing is not attached. Please prepare separately.  
 ※3. Please refer to the swing lever design dimension for quick change lever option that is described below when -F option (quick change lever option) is used.  
 Please make self preparation, when -P option is chosen (balance lever option).

### Quick-Change Lever Design Dimensions

※ Reference for designing quick change swing lever.

Corresponding Model No.



Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	16	19	22	30	34
B	19	22	25	30	36
C	8	9.5	11	15	17
D	$12^{0}_{-0.016}$	$14^{0}_{-0.016}$	$16^{0}_{-0.016}$	$20^{0}_{-0.016}$	$25^{0}_{-0.020}$
E	13	15	18	22	26.5
F	7.75	9.25	11	13.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	2	4
L	11.5	13.5	15.5	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Q	2.25	2.5	3.5	3.5	4
R	2.5	3	4	4	4
S	10.5	13	13	17	19.5
T	2.9	3.4	4.5	4.5	4.5
Phasing Pin (Reference)※5	$\phi 2.5 \times 6$	$\phi 3 \times 8$	$\phi 4 \times 8$	$\phi 4 \times 10$	$\phi 4 \times 10$

Notes

- Swing lever should be designed with its length according to performance graph.
  - If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.
  - Sells the tightening bolt (WHZ□0-B) for lever separately.
- ※4. The pin hole for lever phasing ( $\phi R$ ) should be added if necessary.  
 ※5. The pin for lever phasing is not attached. Please prepare separately.

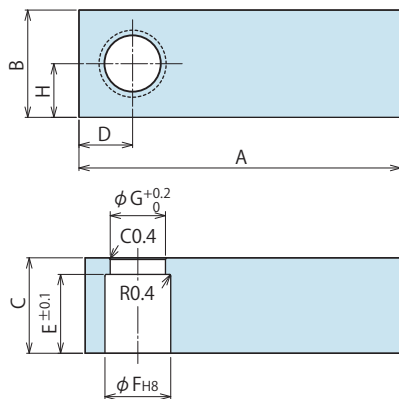
● Accessories : Material Swing Lever for Taper Lock Option

Model No. Indication

**WHZ 160 0 - T**

Size  
(Refer to following table)

Design No.  
(Revision Number)



(mm)

Model No.	WHZ0600-T	WHZ1000-T	WHZ1600-T	WHZ2500-T	WHZ4000-T
Corresponding Model No.	WHE0600-2□□□	WHE1000-2□□□	WHE1600-2□□□	WHE2500-2□□□	WHE4000-2□□□
	WHE0600-2□□□-Y□	WHE1000-2□□□-Y□	WHE1600-2□□□-Y□	WHE2500-2□□□-Y□	WHE4000-2□□□-Y□
A	90	90	125	150	170
B	21	25	28	34	45
C	14	16	18	22	26
D	10.5	12.5	14	17	23
E	11	13	15	18	22
F	14 <sup>+0.027</sup> / <sub>0</sub>	16 <sup>+0.027</sup> / <sub>0</sub>	18 <sup>+0.027</sup> / <sub>0</sub>	22 <sup>+0.033</sup> / <sub>0</sub>	28 <sup>+0.033</sup> / <sub>0</sub>
G	11	13	15	17	23.5
H	10.5	12.5	14	17	22.5

Notes

1. Material : S50C
2. If necessary, the front end should be additionally machined.
3. When determining the phase, refer to taper lock lever design dimensions for each model for the additional machining.
- ※6. Please refer to the accessory for quick change option when 'F' option (quick change lever option) is used.  
Please make self preparation, when P option is chosen (balance lever option).

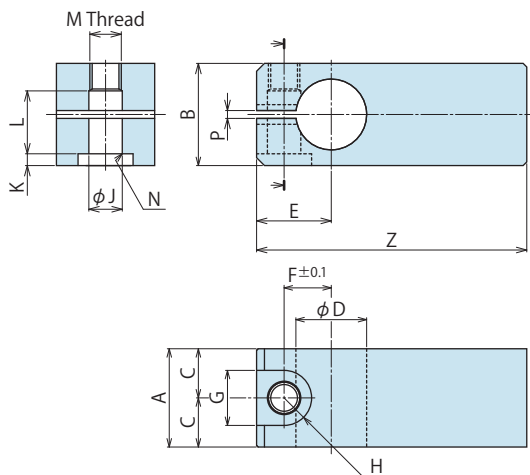
● Accessories : Material Swing Lever for Quick Change Option

Model No. Indication

**WHZ 160 0 - F**

Size  
(Refer to following table)

Design No.  
(Revision Number)



(mm)

Model No.	WHZ0600-F	WHZ1000-F	WHZ1600-F	WHZ2500-F	WHZ4000-F
Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	16	19	22	30	34
B	19	22	25	30	36
C	8	9.5	11	15	17
D	12 <sup>0</sup> / <sub>-0.016</sub>	14 <sup>0</sup> / <sub>-0.016</sub>	16 <sup>0</sup> / <sub>-0.016</sub>	20 <sup>0</sup> / <sub>-0.016</sub>	25 <sup>0</sup> / <sub>-0.020</sub>
E	13	15	18	22	26.5
F	7.75	9.25	11	13.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	2	4
L	11.5	13.5	15.5	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Z	95	105	120	150	170

Notes

1. Material S50C
2. If necessary, the front end should be additionally machined.
3. When determining the phase, refer to quick change lever design dimensions for each model for the additional machining.
4. Sells the tightening bolt for lever separately.

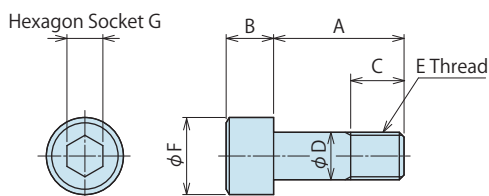
● Accessories : Tightening Bolts for Quick Change Lever

Model No. Indication

**WHZ 160 0 - B**

Size  
(Refer to following table)

Design No.  
(Revision Number)



(mm)

Model No.	WHZ0600-B	WHZ1000-B	WHZ1600-B	WHZ2500-B	WHZ4000-B
Corresponding Model No.	WHE0600-2□□□-F	WHE1000-2□□□-F	WHE1600-2□□□-F	WHE2500-2□□□-F	WHE4000-2□□□-F
A	17.5	20	22	28	32
B	5	6	8	10	12
C	6.5	7	9	11	13
D	5	6	8	10	12
E	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
F	8.5	10	13	16	18
G	4	5	6	8	10

**High-Power Series**

- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others

High-Power Hydraulic Swing Clamp

- LHE

High-Power Hydraulic Link Clamp

- LKE

High-Power Pneumatic Hole Clamp

- SWE

**High-Power Pneumatic Swing Clamp**

- WHE

High-Power Pneumatic Link Clamp

- WCE

High-Power Pneumatic Work Support

- WNC

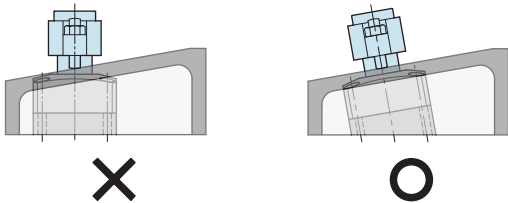
High-Power Pneumatic Pallet Clamp

- WVS

## Cautions

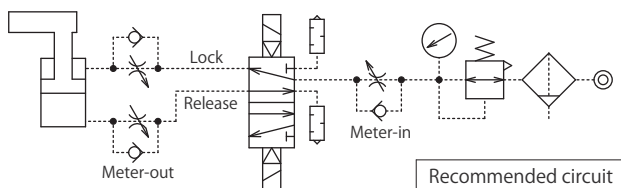
### Notes for Design

- 1) Check Specifications
  - Please use each product according to the specifications.
- 2) Notes for Circuit Design
  - Never supply pressure simultaneously to lock and release ports. If there is something wrong with the circuit design, it leads to get the applications damaged and work wrongly.
- 3) Swing lever should be designed so that the inertia moment is small.
  - Large inertia moment will degrade the lever's stopping accuracy and cause undue wear to the clamp. Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
  - Please set the allowable operating time after the inertia moment is calculated. Please make sure that the clamps work within allowable operating time while referring to the allowable operating time graph.
  - If large flow air is supplied right after installation, the action time may become extremely fast, resulting in major clamp damage. Install the speed controller (meter-in) beside the air source and gradually supply air.
- 4) When using on a welding fixture, the exposed area of piston rod should be protected.
  - If spatter gets onto the sliding surface it could lead to malfunction and fluid leakage.
- 5) When clamping on a sloped surface of the workpiece
  - Make sure the clamp surface and mounting surface of the clamp are parallel.



### 6) Swing Speed Adjustment

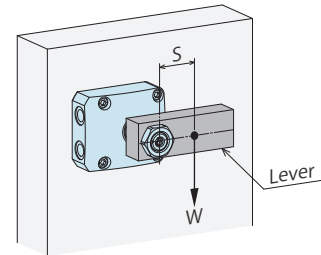
- Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- Install the speed controller (meter-out), and gradually adjust the speed to the setting from low speed (the status of small flow). If the speed control is carried out from high speed (the status of big flow), the machine and equipment may be damaged.



- Please set one speed controller for each clamp (meter-out) if multiple clamps are synchronized for action.

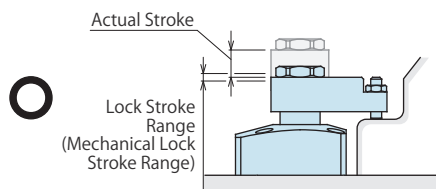
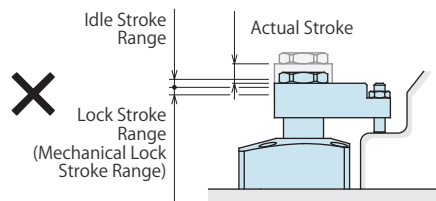
### 7) Consideration for Lever Design

- The lever should be as light as possible. The rotation may not be done because of the air pressure, lever mounting position and shape. The swinging may be stopped in the middle of action if a large lever horizontally mounted is used. Use the lever where the value of (lever weight  $W$ )  $\times$  (gravity center  $S$ ) is below that in the table below.



Model	(Lever Length $W$ ) $\times$ (Center of Gravity $S$ ) (N·m)
WHE0600	0.08
WHE1000	0.10
WHE1600	0.20
WHE2500	0.45
WHE4000	0.90

- 8) The specification value is not fulfilled when clamping out of the lock stroke range.
  - When clamping by movement stroke within the swing stroke range, the mechanical lock mechanism will not operate and cylinder output force, clamping force, holding force, and the completion position repeatability accuracy of a lock will not fulfill a specification value.





### ● Installation Notes

#### 1) Check the fluid to use.

- Please supply filtered clean dry air. (Install the drain removing device.)
- Oil supply with a lubricator etc. is unnecessary. Oil supply with a lubricator may cause loss of the initial lubricant. The operation under low pressure and low speed may be unstable. (When using secondary lubricant, please supply lubricant continuously. Otherwise, the initial grease applied from KOSMEK will be removed from the secondary lubricant.)

#### 2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with this product for prevention of contaminants in the air circuit.

#### 3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screwing direction. Wrapping in the wrong direction will cause leaks and malfunction.
- Pieces of the sealing tape can lead to air leaks and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in products.

#### 4) Mounting the Unit

- When mounting the product use four hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model	Thread Size	Tightening Torque(N·m)
WHE0600	M5×0.8	6.3
WHE1000	M5×0.8	6.3
WHE1600	M5×0.8	6.3
WHA2500	M6×1	10
WHA4000	M6×1	10

#### 5) Installing flow Control Valve

- Torque to 5 – 7Nm.

#### 6) Mounting and removing the swing lever.

- Oil or debris on the mating surfaces of the lever, taper sleeve or piston rod can cause the rod to loosen. Clean carefully before assembly.
- Lever arm mounting bolt torques are shown below.

Standard: Taper Lock Lever Option

Model	Thread Size	Tightening Torque(N·m)
WHE0600	M10×1	10 ~ 13
WHE1000	M12×1.5	17 ~ 20
WHE1600	M14×1.5	21 ~ 25
WHE2500	M16×1.5	33 ~ 40
WHE4000	M22×1.5	84 ~ 100

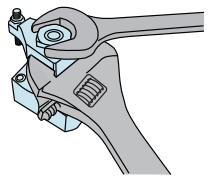
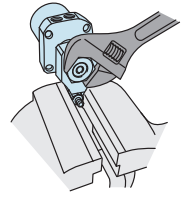
-F : Quick-Change Lever Option

Model	Thread Size	Tightening Torque (N·m)
WHE0600-2□□□-F	M5×0.8	7.5
WHE1000-2□□□-F	M6×1	13
WHE1600-2□□□-F	M8×1	32
WHE2500-2□□□-F	M10×1.25	65
WHE4000-2□□□-F	M12×1.5	100 ~ 114

- If the piston rod is subjected to excessive torque or shock, the rod or the internal mechanism may be damaged. Observe the following points to prevent such shock.

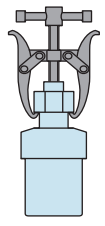
#### For Installation

- ① With the clamp positioned to the fixture, determine the lever position, and temporarily tighten the nut for fixing the lever.
- ② Remove the clamp from the fixture, fix the lever with machine vise etc., and tighten the nut.
- ③ If tightening the nut with the clamp positioned to the fixture, please use a wrench to the hexagon part of piston rod, or fix the lever with a spanner. It is best to bring the lever to the middle of the swing stroke before tightening the nut.



#### For Removal

- ① While the clamp is fixed to the fixture or vise, use a wrench to bring the lever to the middle of the swing stroke and then loosen the nut.
- ② Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.



#### 7) Swing Speed Adjustment

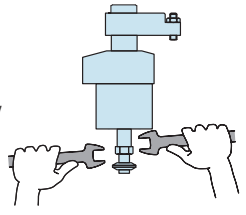
- Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

#### 8) Checking looseness and retightening

- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

#### 9) Notes on double end rod option (-D) for dog application.

- When attaching dog, set up the piston so that it will not turn around. Please secure the dog or cam and prevent any rotation or torque on the piston rod. Torque values for the mounting screw are shown in the table below.



Model	Thread Size	Tightening Torque (N·m)
WHE0600-2□□D	M4×0.7	3.2
WHE1000-2□□D	M5×0.8	6.3
WHE1600-2□□D	M5×0.8	6.3
WHE2500-2□□D	M6×1	10
WHE4000-2□□D	M6×1	10

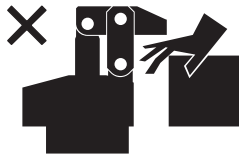
※ Please refer to P.1045 for common cautions. • Notes on Handling • Maintenance/Inspection • Warranty



## ● Cautions

### ● Notes on Handling

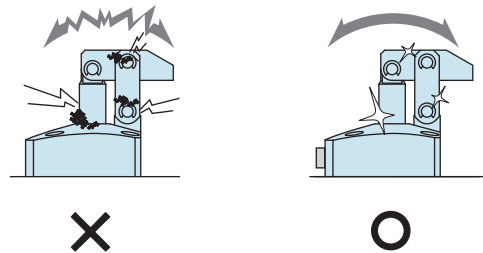
- 1) It should be handled by qualified personnel.
  - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
  - ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
  - ② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
  - ③ After stopping the machine, do not remove until the temperature cools down.
  - ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.
- 3) Do not touch clamps (cylinder) while clamps (cylinder) is working. Otherwise, your hands may be injured due to clinching.



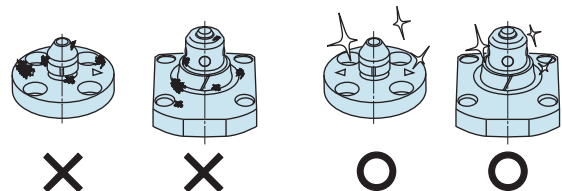
- 4) Do not disassemble or modify.
  - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

### ● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
  - Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
  - Make sure there is no abnormality in the bolts and respective parts before restarting.
- 2) Regularly clean the area around the piston rod and plunger.
  - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.



- 3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VL/VM/VJ/VK/WVS/WM/WK/VX/VXF)
  - Location products, except VX/VXF model, can remove contaminants with cleaning functions. When installing pallets make sure there is no thick sludge like substances on pallets.
  - Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.



- 4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- 5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
- 6) Make sure the hydraulic fluid has not deteriorated.
- 7) Make sure there is smooth action and no abnormal noise.
  - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 8) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 9) Please contact us for overhaul and repair.

## ● Warranty

### 1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

### 2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.

Defects or failures caused by the following are not covered.

- ① If the stipulated maintenance and inspection are not carried out.
- ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
- ③ If it is used or handled in inappropriate way by the operator.  
(Including damage caused by the misconduct of the third party.)
- ④ If the defect is caused by reasons other than our responsibility.
- ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
- ⑥ Other caused by natural disasters or calamities not attributable to our company.
- ⑦ Parts or replacement expenses due to parts consumption and deterioration.  
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

# Air Flow Control Valve

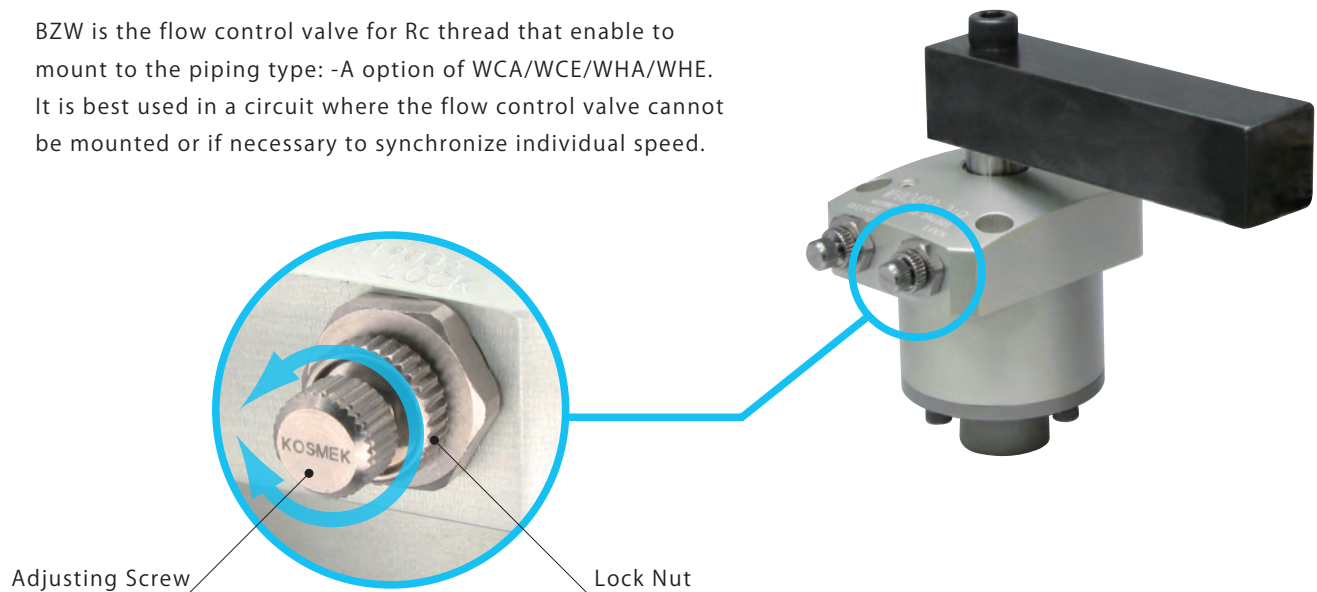
Model BZW



Directly mounted to clamps, easy adjusting

- Directly mounted to clamps

BZW is the flow control valve for Rc thread that enable to mount to the piping type: -A option of WCA/WCE/WHA/WHE. It is best used in a circuit where the flow control valve cannot be mounted or if necessary to synchronize individual speed.



## Corresponding Product Model

Clamps	BZW Model No.	Clamp Model No.
High-Power Pneumatic Link Clamp	BZW0100-A	WCE□1-2 <b>A</b> □
High-Power Pneumatic Swing Clamp	BZW0100-B	WHE□0-2 <b>A</b> □
Pneumatic Swing Clamp		WHA□0-2 <b>A</b> □
Pneumatic Link Clamp		WCA□1-2 <b>A</b> □

Corresponding to piping method -A option.  
 ※ When mounting BZW to piping method G, take off R thread plug and remove the seal tape not to get inside cylinder.

## Model No. Indication

# BZW 010 0 - B

Control Method  
**B** : Meter-out  
**A** : Meter-in

Design No.  
**0** : Revision Number

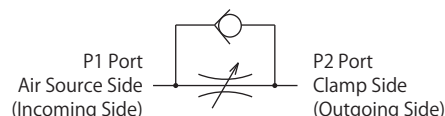
R Thread Size  
**010** : Rc1/8

## Specifications

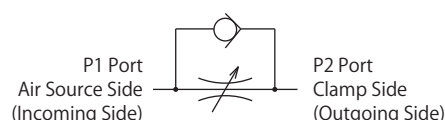
Model No.	BZW0100-B	BZW0100-A
Control Method	Meter-out	Meter-in
Operating Pressure MPa	0.1 ~ 1.0	
Withstanding Pressure MPa	1.5	
Adjust Screw Number of Rotations	10 Rotations	
Tightening Torque N·m	5 ~ 7	
Corresponding Product Model	WHE□0-2A□ WHA□0-2A□ WCA□1-2A□	WCE□1-2A□

## Circuit Symbol

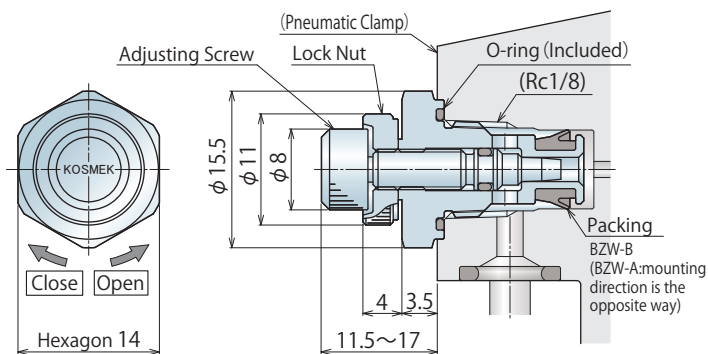
### BZW0100-B : Meter-out



### BZW0100-A : Meter-in

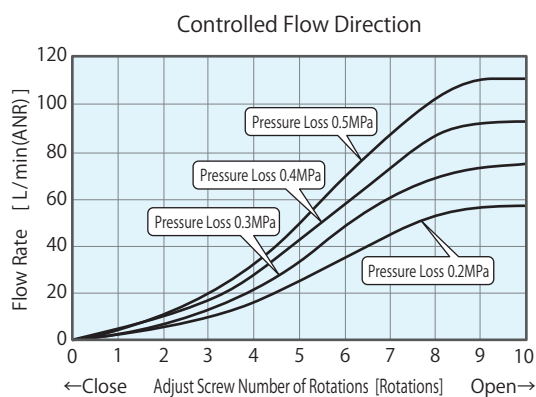


## External Dimensions

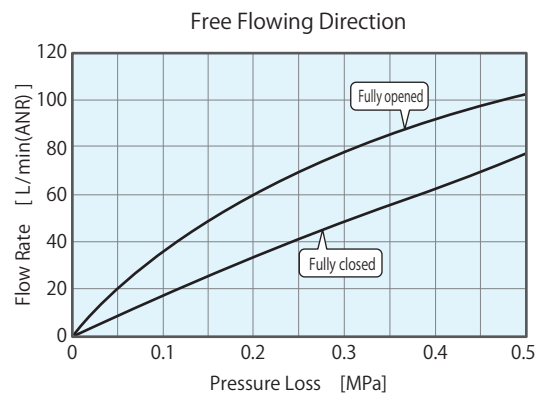
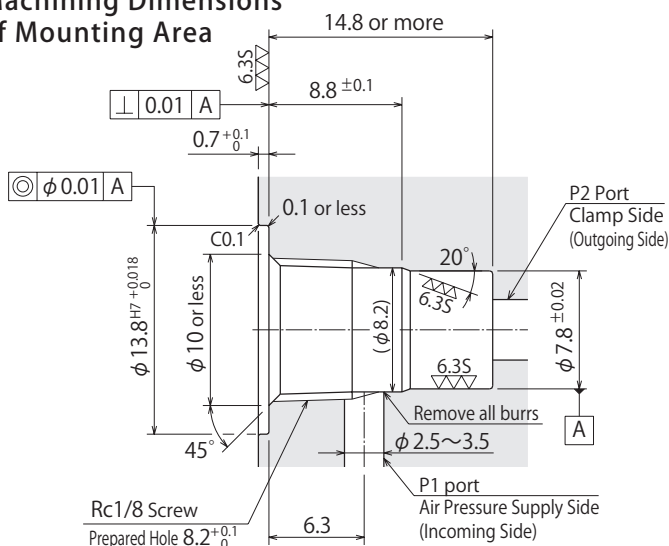


## Flow Rate Graph

### BZW0100-B/BZW0100-A common



## Machining Dimensions of Mounting Area



### Notes

- As the  $\nabla\nabla\nabla$  area is sealing part, pay attention not to damage it.
- Pay attention to have no cutting chips and burring at the tolerance part of the machining hole.
- As shown in the drawing, P1 port is used as the air supply and P2 port as the clamping supply.

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Pneumatic Hole Clamp

SWH

Pneumatic Swing Clamp

WHA

Pneumatic Link Clamp

WCA

Air Flow Control Valve

BZW

Pneumatic Expansion Locating Pin

WM

WK

# Manifold Block

Model WHZ-MD

Model LZY-MD

Model LZ-MS

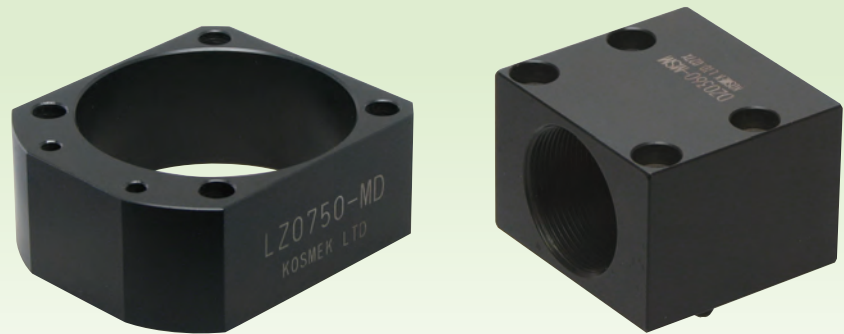
Model LZ-MP

Model TMZ-1MB

Model TMZ-2MB

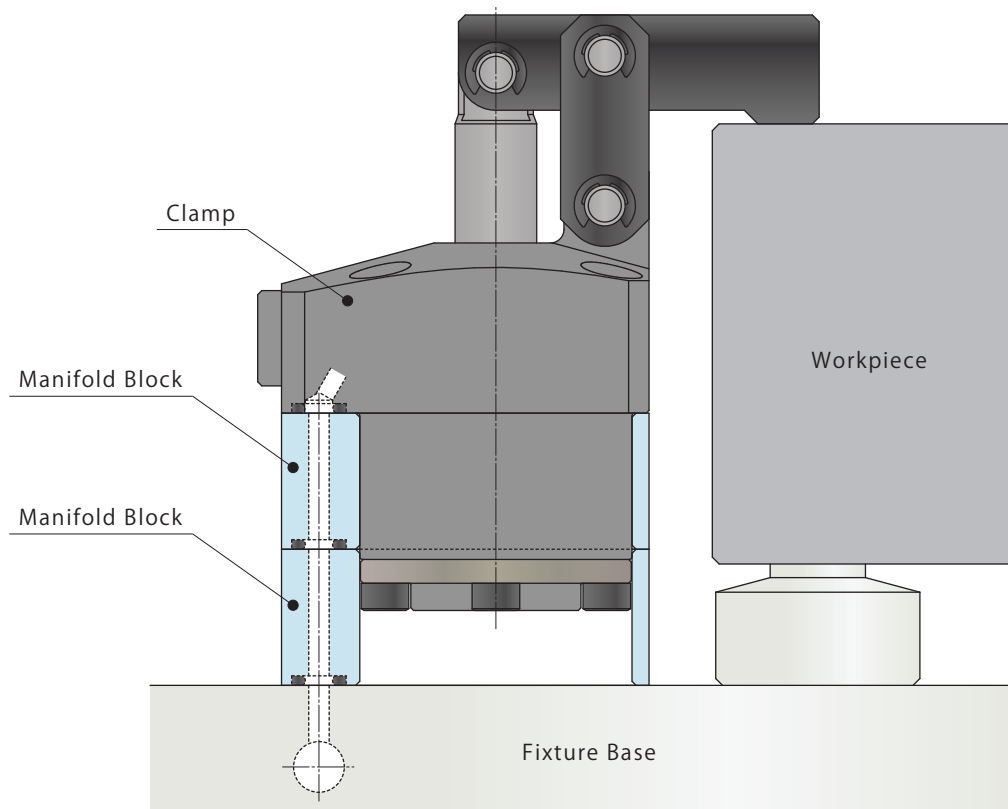
Model DZ-MG

Model DZ-MS



- **Manifold Block**

The mounting height of clamp is adjustable with the manifold block.



### Applicable Model

Manifold Block Model No.	Corresponding Item Model No.
Model <b>WHZ-MD</b>	Model <b>WCA</b> Model <b>WHA</b> Model <b>WCE</b> Model <b>WHE</b>
Model <b>LZY-MD</b>	Model <b>LKA</b> Model <b>LKE</b> Model <b>LHC</b> Model <b>LHS</b> Model <b>LKC</b> Model <b>LHA</b> Model <b>LHE</b> Model <b>LL</b>
Model <b>LZ-MS</b>	Model <b>LM</b> Model <b>LT</b> Model <b>LJ</b> Model <b>LG</b>
Model <b>LZ-MP</b>	Model <b>LC</b> Model <b>TC</b>
Model <b>TMZ-1MB</b>	Model <b>TMA-1</b>
Model <b>TMZ-2MB</b>	Model <b>TMA-2</b>
Model <b>DZ-MG□/MS□</b>	Model <b>DP</b>

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories**
- Cautions / Others

- Screw Locator
  - VXF

- Manual Expansion Locating Pin
  - VX

- Manifold Block**
  - WHZ-MD
  - LZY-MD
  - LZ-MS
  - LZ-MP
  - TMZ-1MB
  - TMZ-2MB
  - DZ-M

- Manifold Block / Nut
  - DZ-R
  - DZ-C
  - DZ-P
  - DZ-B
  - LZ-S
  - LZ-SQ
  - TNZ-S
  - TNZ-SQ

- Pressure Switch
  - JB

- Pressure Gauge
  - JGA/JGB

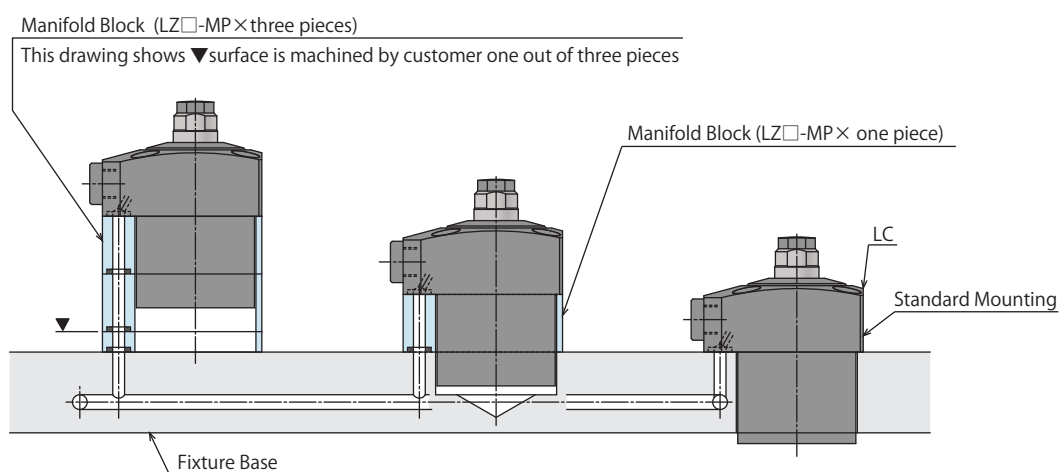
- Manifold
  - JX

- Coupler Switch
  - PS

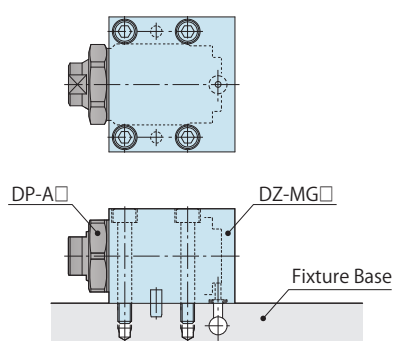
- G-Thread Fitting

### Application Examples

#### • Work Support (LC) Application Example



#### • Push Cylinder (DP) Application Example



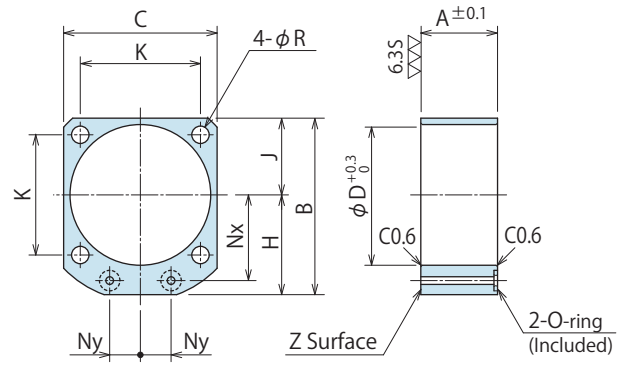
Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

**WHZ 048 0 - MD**

Size  
(Refer to following table)

Design No.  
(Revision Number)



Model No.	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Item Model Number	WCE0601 WHE0600	WCA0321 WHA0320	WCE1001 WHE1000	WCA0401 WHA0400	WCE1601 WHE1600
A	23	25	27	31	35
B	54	60	67	77	88.5
C	45	50	58	68	81
D	40	46	54	64	77
H	31.5	35	38	43	48
J	22.5	25	29	34	40.5
K	34	39	45	53	65
Nx	26	28	31	36	41
Ny	9	10	13	15	20
R	5.5	5.5	5.5	6.5	6.5
O-ring	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.1	0.1	0.1	0.2	0.2

- Notes
1. Material: A2017BE-T4
  2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
  3. If thickness other than A is required, perform additional machining on surface Z. Please refer to the drawing.

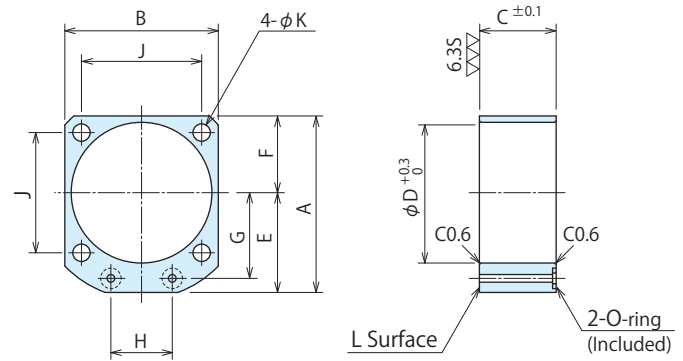
Manifold Block for LKA/LKC/LKE/LHA/LHC/LHE/LHS/LL

Model No. Indication

**LZY 048 0 - MD**

Size  
(Refer to following table)

Design No.  
(Revision Number)



Model No.	LZY0360-MD	LZY0400-MD	LZY0480-MD	LZY0550-MD	LZY0650-MD	LZY0750-MD	LZY0900-MD	LZY1050-MD
Corresponding Item Model Number	LKA0360 / LKE0360 LHA0360 / LHC0360 LHE0360 / LHS0360 LLO360	LKA0400 / LKC0400 LKE0400 / LHA0400 LHC0400 / LHE0400 LHS0400 / LLO400	LKA0480 / LKC0480 LKE0480 / LHA0480 LHC0480 / LHE0480 LHS0480 / LLO480	LKA0550 / LKC0550 LKE0550 / LHA0550 LHC0550 / LHE0550 LHS0550 / LLO550	LKA0650 / LKC0650 LHA0650 / LHC0650 LHS0650 LLO650	LKA0750 LHA0750 LHS0750 LLO750	LKA0900 LHA0900 LHS0900 LLO900	LKA1050 LHA1050 LHS1050 LLO1050
A	49	54	61	69	81	92	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	29	31.5	35.5	39	46	52	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
G	23.5	26	30	33.5	39.5	45	52.5	60
H	16	18	22	24	30	32	37	45
J	31.4	34	40	47	55	63	75	88
K	4.5	5.5	5.5	6.8	6.8	9	11	14
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

- Notes
1. Material: S45C
  2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.
  3. If thickness other than C is required, perform additional machining on surface L. Please refer to the drawing.

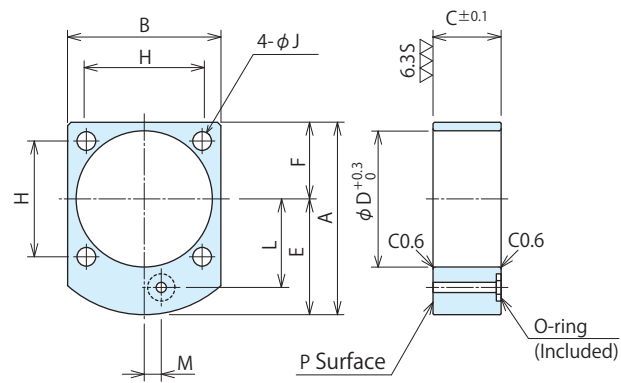
**Manifold Block for LM/LJ/LT/LG**

Model No. Indication

**LZ 048 0 - MS**

Size  
(Refer to following table)

Design No.  
(Revision Number)



(mm)

Model No.	LZ0360-MS	LZ0400-MS	LZ0480-MS	LZ0550-MS	LZ0650-MS	LZ0750-MS	LZ0900-MS	LZ1050-MS
Corresponding Item Model Number	LT0360 LM0360	LT0400 LM0400	LT0480 LM0480	LT0550 LM0550	LT0650 LM0650	LT0750 LM0750	LG0900 LJ0902	LG1050 LJ1052
A	51.5	56.5	62	70	82	93	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	31.5	34	36.5	40	47	53	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
H	31.4	34	40	47	55	63	75	88
J	4.5	5.5	5.5	6.8	6.8	9	11	14
L	23.5	26	30	33.5	39.5	45	52.5	60
M	5	5	0	0	0	0	0	0
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

- Notes
1. Material: S45C
  2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.
  3. If thickness other than C is required, perform additional machining on surface L. Please refer to the drawing.

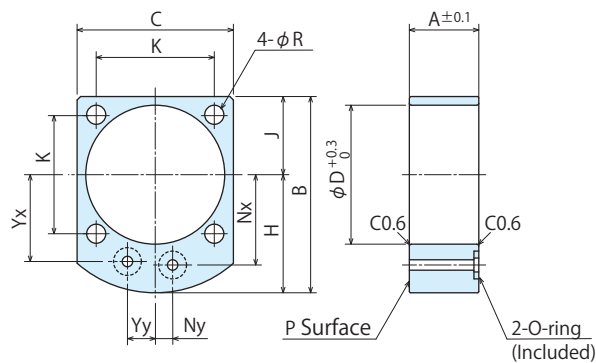
**Manifold Block for LC/TC**

Model No. Indication

**LZ 048 0 - MP**

Size  
(Refer to following table)

Design No.  
(Revision Number)



(mm)

Model No.	LZ0400-MP	LZ0480-MP	LZ0550-MP	LZ0650-MP	LZ0750-MP	LZ0900-MP
Corresponding Item Model Number	LC0402 TC0402	LC0482 TC0482	LC0552 TC0552	LC0652 TC0652	LC0752 TC0752	LC0902
A	20	27	30	32	37	45
B	56.5	62	70	82	93	107
C	45	51	60	70	80	95
D	40	48	55	65	75	90
H	34	36.5	40	47	53	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
Nx	26	30	33.5	39.5	45	52.5
Ny	5	0	0	0	0	0
R	5.5	5.5	6.8	6.8	9	11
Yx	25	28	31	37	42.5	50
Yy	8	11	13	14	15	15
O-ring	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Mass kg	0.2	0.3	0.4	0.5	0.8	1.2

- Notes
1. Material: S45C
  2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
  3. If thickness other than A is required, perform additional machining on surface P. Please refer to the drawing.

- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others
- Screw Locator
  - VXF
- Manual Expansion Locating Pin
  - VX
- Manifold Block
  - WHZ-MD
  - LZY-MD
  - LZ-MS
  - LZ-MP
  - TMZ-1MB
  - TMZ-2MB
  - DZ-M
- Manifold Block / Nut
  - DZ-R
  - DZ-C
  - DZ-P
  - DZ-B
  - LZ-S
  - LZ-SQ
  - TNZ-S
  - TNZ-SQ
- Pressure Switch
  - JB
- Pressure Gauge
  - JGA/JGB
- Manifold
  - JX
- Coupler Switch
  - PS
- G-Thread Fitting



# Sales Offices

## Sales Offices across the World

Japan	<b>TEL. +81-78-991-5162</b>	<b>FAX. +81-78-991-8787</b>
Overseas Sales	KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241 〒651-2241 兵庫県神戸市西区室谷2丁目1番5号	
USA	<b>TEL. +1-630-241-3465</b>	<b>FAX. +1-630-241-3834</b>
KOSMEK (USA) LTD.	1441 Branding Avenue, Suite 110, Downers Grove, IL 60515 USA	
China	<b>TEL.+86-21-54253000</b>	<b>FAX.+86-21-54253709</b>
KOSMEK (CHINA) LTD. 考世美(上海)貿易有限公司	21/F, Orient International Technology Building, No.58, Xiangchen Rd, Pudong Shanghai 200122., P.R.China 中国上海市浦东新区向城路58号东方国际科技大厦21F室 200122	
Thailand	<b>TEL. +66-2-715-3450</b>	<b>FAX. +66-2-715-3453</b>
Thailand Representative Office	67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand	
Taiwan (Taiwan Exclusive Distributor)	<b>TEL. +886-2-82261860</b>	<b>FAX. +886-2-82261890</b>
Full Life Trading Co., Ltd. 盈生貿易有限公司	16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511 台湾新北市中和區建八路2號 16F-4 (遠東世紀廣場)	
Philippines (Philippines Exclusive Distributor)	<b>TEL.+63-2-310-7286</b>	<b>FAX. +63-2-310-7286</b>
G.E.T. Inc, Phil.	Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427	
Europe (Europe Exclusive Distributor)	<b>TEL. +43-463-287587-10</b>	<b>FAX. +43-463-287587-20</b>
KOS-MECH GmbH	Schleppeplatz 2 9020 Klagenfurt Austria	
Indonesia (Indonesia Exclusive Distributor)	<b>TEL. +62-21-5818632</b>	<b>FAX. +62-21-5814857</b>
P.T PANDU HYDRO PNEUMATICS	Ruko Green Garden Blok Z- II No.51 Rt.005 Rw.008 Kedoya Utara-Kebon Jeruk Jakarta Barat 11520 Indonesia	

## Sales Offices in Japan

Head Office	<b>TEL.078-991-5115</b>	<b>FAX.078-991-8787</b>
Osaka Sales Office	〒651-2241 兵庫県神戸市西区室谷2丁目1番5号	
Overseas Sales		
Tokyo Sales Office	<b>TEL.048-652-8839</b>	<b>FAX.048-652-8828</b>
	〒331-0815 埼玉県さいたま市北区大成町4丁目81番地	
Nagoya Sales Office	<b>TEL.0566-74-8778</b>	<b>FAX.0566-74-8808</b>
	〒446-0076 愛知県安城市美園町2丁目10番地1	
Fukuoka Sales Office	<b>TEL.092-433-0424</b>	<b>FAX.092-433-0426</b>
	〒812-0006 福岡県福岡市博多区上牟田1丁目8-10-101	

# Global Network



Asia Detailed Map



● FOR FURTHER INFORMATION ON UNLISTED SPECIFICATIONS AND SIZES, PLEASE CALL US.  
 ● SPECIFICATIONS IN THIS CATALOG ARE SUBJECT TO CHANGE WITHOUT NOTICE.

